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ALBERTA INDUSTRY & RESOURCES

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Introduction

A new mood of confidence and higher expectations is beginning to pervade the national economy. The international economic malaise of recent years was a period of adjustment, consolidation and retrenchment from which businesses are emerging with heightened productivity and renewed competitive spirits.

Alberta is preparing for another period of expansion and development — hopefully one without the frenetic and unsustainable pace of the last decade.

The basic regional resources of field, mine, and forest are those which are in greatest and most constant demand. Human and financial resources are available to ensure their effective utilization.

Presented in this publication are statistical data and analytical descriptions concerning the industries and resources of the province. They are general in nature to provide background information for both market research and for lay readers; more specific data and informative detail are available from the Department.

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Wherever possible, articles were obtained from knowledgeable officials in a variety of Alberta government departments and agencies. Officials of these departments welcome further enquiries concerning their areas of specialty and will supply additional background information not available within the scope of this publication.

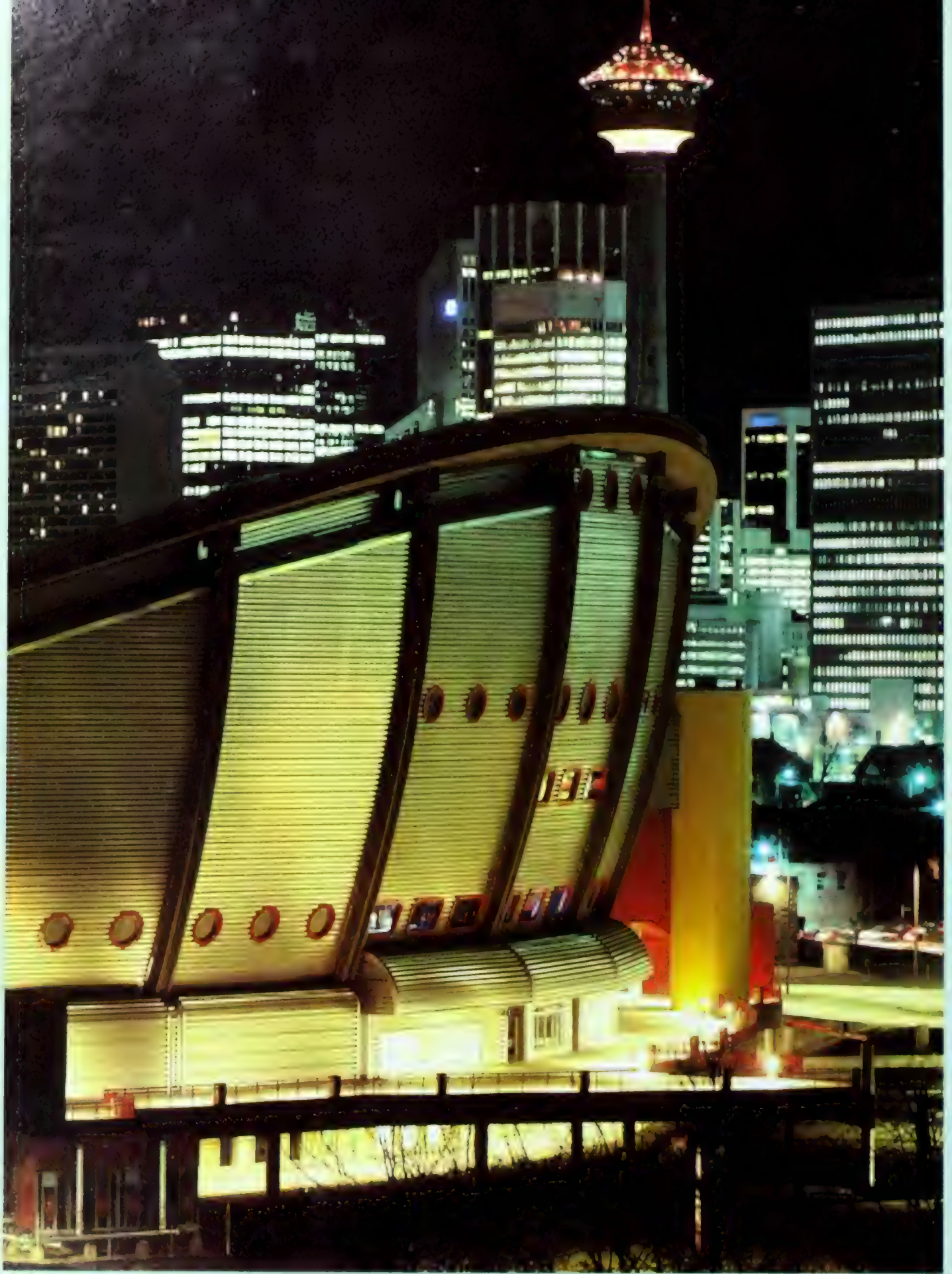
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Alberta Economic Development
Edmonton, Alberta
December, 1984

Alberta in the World



DISTANCE IN KILOMETRES



Province of Opportunity

Rich in agricultural land, minerals forests, energy resources, and scenic and climatic diversity, western Canada is becoming a major economic and industrial region of the country.

In the hundred years since Canada became a nation and Rupert's land was taken over from a company of adventurers, western Canada has progressed from a fur trappers' fiefdom, through a rough and severe era of dependency on subsistence farming, ranching, and lumbering, to another era in which it is reassessing its resources and expecting recognition of its changed prospects.

Over the century of achievement the land was settled and brought under plow and reaper and axe; modern cities were built offering the amenities and cultural opportunities of those in much older societies. Road, rail and airway connections were built to world standards. High quality educational, medical, and social welfare systems were installed. Scientific and technological knowledge was harnessed for the development of mineral, industrial, agricultural and forestry resources.

These achievements owe much to the human, the intellectual, the financial, and the scientific assistance which was attracted from other regions of Canada and from other countries. The presence of the basic natural resources was coupled with a welcome and a willingness of governments to encourage people to take advantage of the proffered aid.

Alberta has an abundance of agricultural land, petroleum energy resources, and forests. British Columbia is rich in timber, minerals, hydro-electric

energy, and fertile valleys. Saskatchewan has rich agricultural land, uranium and petroleum energy resources and vast deposits of other minerals, particularly potash, basic to many crop fertilizers. Manitoba features hydro-electric energy, mineral resources and good farmland. All four provinces have an ethnically diverse population, many inhabitants only a generation removed from the pioneers who settled and opened up the land. Western Canada can be looked at as a whole market and resource unit with many common features.

From the perspective of the 1980's, Alberta's economic evolution has been of two parts dated accidentally, but neatly, as pre- and post-Second World War. In the early period, Alberta had an agricultural economy subject to the annual fluctuations of market prices and weather vagaries. Buoyant prosperity alternated with struggles for survival — physical and financial. In the more recent period, the discovery and exploitation of petroleum energy reserves, coupled with general world-wide prosperity and stability of market demand, brought broader-based economic development featuring mining, nascent manufacturing industries, commercial expansion, and construction of the physical plant to support and accommodate growth. In very recent years, the surge in energy prices has resulted in increased resource revenues which the government is endeavoring to manage wisely and effectively, aiming to strike a balance between the needs and desires of the present, and an obligation to use part of a current surplus to build a strong economic base for the future.

Left
In foreground
Calgary's Saddledome
- One of the sites to
be used for the 1988
Calgary Winter
Olympics



All major industries have shown sustained growth and diversification in the post-war period. New crops, such as canola, and new and better varieties of other grains and field crops have been developed and accepted. Livestock breeds and feeding methods have been successfully adopted and adapted. Storage facilities have evolved making local field crop produce available almost year round. Refrigerated transportation makes the local slaughtering and processing of livestock for external markets economically feasible.

The story of the petroleum mining boom is well known. Natural gas is exported deep into the United States, and as far east as Montreal, in Canada. Large volumes of crude oil were also exported to the United States offsetting the large volumes imported from foreign countries into central and eastern Canada. The spin-off and multiplier effects of the mining boom were the more important and long-lasting. In the post-war period, some \$120 billion of new capital investment was brought into western Canada, the bulk of it into Alberta. Support and service industries flourished. Manufacturing plants, using petroleum products either as raw materials or as energy sources, were introduced; other types of manufacturing plants were successful because of the general increase in economic activity and incomes. Government revenues from the mining industry were such that most taxes remained low or were even abolished.

Perhaps the greatest effect, however, was the unquantifiable impact on the morale and self-confidence of Albertans in knowing that, for a foreseeable future, they would live in a reasonably secure and stable economic environment.

Manufacturing output is increasing steadily in terms of both growth and diversity. A basis is being laid for future expansion and evolution. The heavy dependence on central Canadian and foreign sources of manufactured products is being gradually eroded. Population increases and the even more rapid increases in general economic activity, make the province ever more attractive as a viable manufacturing base.

To provide the physical infrastructure for a growing population and for the service and support facilities which are among the visible manifestations of economic growth, the construction

industry has been extremely active. On a per capita basis, Alberta's annual construction volume has been the highest in Canada for much of the post-war period. The changed cities and landscapes, the quality of traffic arteries, the thousands of kilometres of buried pipeline, and the huge industrial plants extracting petroleum from the oil sands, all attest to the success and diversity of the construction industry. Market opportunities for products and skills exist for those who have the initiative, intuition and drive to seek and develop them. Local, regional and Canadian markets are limited only by population size factors and by the development stages of other forms of industry or commerce. The over two million persons of Alberta, the over seven million of western Canada, and the twenty-five million of Canada, all offer distinct sizes and types of markets for different sizes and types of firms. Each of those market groups has doubled in size over the past three decades; enterprises which would not have been viable in 1950, can be in the 1980's. Many enterprises not viable in the past because of lack of related and complementary firms with their ranges of products, can be successful today because of industrial development in other fields. Industrial opportunities in Alberta are increasing rapidly.

Exports to American markets have generally involved raw and semi-processed materials. Population concentrations directly to the south are lacking, except along the Pacific coast, making it unrealistic to anticipate southerly flows of trade for many consumer goods. There are large, though variable and uncertain, markets for lumber products, petroleum and semi-processed petrochemical raw materials, chemical fertilizers, and minerals. For most of these products "world scale" or very large organizations and plants are necessary. Many Canadian consumer goods cannot be competitively priced due to the larger sizes of American plants built to serve their own larger markets, and to the tariffs which still shield their own producers. Nevertheless this does not negate the wisdom of exploring individual export opportunities for processed goods, particularly those incorporating specialized design or technology, nor does it negate the basic advantage of the presence of the vast reserves of the vital feedstocks of petroleum, natural gas and coal.



Another exciting and promising development in the post-war period has been the dramatic industrialization of the so-called "Pacific Rim". Asian countries. At this time they represent a prime undeveloped market for raw and upgraded products of mines, fields, and forests. Already, they take significant volumes of coal, grains and forest products. In none of these does Canada have a monopoly nor, given their market status, do Pacific Rim countries have any special obligation to funnel or direct their purchases to Canada. The only certainty is the potential size of the trade opportunity. Realism in prices, wages, profit margins, and production efficiency is required to share in it.

Western Canada, and specifically Alberta, does have some inherent industrialization disadvantages to overcome. The major population concentrations of North America and of other countries are distant; given its immense area the regional population is still relatively sparse as well. Older, longer settled regions have longstanding advantages and vested interests in established financial and industrial complexes. Western Canada has not yet amassed its own pools of financial and human capital to use in independent self-development — though this constraint may fade relatively rapidly.

Although progress has been significant, especially in the post-war period, the industrial complex of western Canada is not yet an interlocking, self-generating, self-perpetuating, melded group of plants. Most major plants were built to process raw materials for finishing plants in other regions closer to large markets.

Regional advantages, however, are potent forces. The harnessing of energy has been the distinguishing factor of the industrial revolution of modern times. An abundance of energy resources is a central and major advantage possessed by Alberta. Whether used regionally for industrial development, or exported to other regions, it is of an intrinsic advantage to the possessors. Long term assurance of supply will likely become an increasingly important factor in industrial location decisions.

Coal, natural gas and petroleum resources are present in abundance. No less impressive is the list of other mineral, timber and agricultural resources in

terms of both volume and variety.

Alberta welcomes industry and industrial growth. In recent years significant caveats have been placed on development to ensure environmental protection of land, water, air and health, but such restrictions are becoming universally accepted and welcomed phenomena. Public acceptance of industrial growth is based on the desires for security of employment, wider ranges of choice of occupations, and for the opportunities to acquire the products of technology and science.

Outside investment, whether national or foreign, is welcomed to finance the major large scale industrial developments. Large capital infusions are usually accompanied by the managerial and technical expertise needed to ensure that they are used efficiently, effectively, and profitably. In the process, a generation of native talent is being trained.

The Alberta government is supportive of the free enterprise philosophy. It encourages business activity that operates in a manner compatible with continuing economic development and protection of the local public interest. Health, safety, and work standards are set and enforced. Labour and management bargaining procedures are laid down and supervised. Labour force training through schools, universities, technical institutes and apprenticeship programs is provided and encouraged.

Though the vast bulk of industrial development is expected to be unassisted and privately financed, measures are in place for aiding small businesses, both urban and rural.

At the other end of the scale, assistance and arrangements are made to encourage and stimulate the huge natural resource developments which put strains on even the largest private companies.

It is both feasible and probable that the pace of Alberta's industrial and population growth will, for the foreseeable future, far exceed that of less favoured areas. Petroleum and natural gas are likely to remain the preferred energy sources, both because of their transportation advantages and because of the tremendous existing capital investment in machines and industries which have been developed to use them. Although conventional resources of petroleum are becoming more scarce, the tremendous quantities contained in the oil

sands are defined, and initial attempts at extraction and processing are proving successful. It is expected that tremendous amounts of financial capital will continue to be expended on oil extraction plants over the balance of this century and into the next. The industrial stimulus given to western Canada in the construction and maintenance of the plants, new towns and cities, the service and support facilities, is certain to exceed that which accompanied the development of the conventional oil resources during the last generation. Because of the industrial and commercial maturity which accrued then, it is likely that the multiplier and spin-off effects will be even greater in this second round.

If these regional developments can be accompanied by successful entry into wider markets, future industrial development prospects are very bright.

In the pages which follow are statements and data recording the economic progress of Alberta in recent years.

Economic Accounts

The economic accounts of a specific geographic region are a measure of the total value of production during a given time frame. They are similar to the accounting practices of business enterprises and are the best measure of economic performance over time. The value of production for Alberta is measured by Gross Domestic Product (GDP), which is an estimate of the total value of goods and services produced within the boundaries of the province in a

given period of time.

There are two methods used to estimate GDP for Alberta. The first is the income approach, which is a summation of income accruing to each factor of production. These include wages, salaries and supplementary labour income, farm income, unincorporated business income, corporation profits, interest and miscellaneous investment income, capital consumption allowances, inventory valuation adjustment, and indirect taxes less subsidies.

The outlay approach measures the purchase of goods and services by all final users: consumers, business and government; plus the value of physical change in inventories; plus exports minus imports. The sum of the market values of goods and services sold should theoretically be equal to the value of income accruing to the factors of production. Due to statistical problems, these two approaches do not add to the same figures, the difference being reflected in the residual entry in both the income and outlay accounts.

The outlay account can be separated into price and quantity components. When quantities are measured by the prices prevailing in the year in which production took place, the value of production is called GDP in current dollars. When all production is measured with the market prices which existed in a previous base year (i.e. 1971), it is said that production is measured in constant dollars. Measuring production in constant dollars removes the component of growth due to price changes, or inflation, and provides a

TABLE 1.1

**ECONOMIC
ACCOUNTS -
OUTLAY ACCOUNT
OF GROSS DOMESTIC
PRODUCT IN
CONSTANT (1971)
DOLLARS - ALBERTA -
1972 - 1982
(MILLIONS
OF DOLLARS)**

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Sales to Persons	4,594	4,846	5,262	5,750	6,315	6,708	7,109	7,588	8,026	8,399	8,295
Sales to Government	1,396	1,550	1,649	1,767	1,888	1,949	2,010	2,247	2,313	2,423	2,534
Gross Fixed Capital Formation	2,360	2,695	2,982	3,398	4,228	4,391	4,846	5,641	6,240	7,283	6,328
Residential Construction	520	544	550	547	803	816	995	1,013	904	937	716
Non-Residential Construction	1,515	1,249	1,354	1,694	1,794	2,087	2,249	2,784	3,545	4,103	3,750
Machinery and Equipment	689	902	1,078	1,157	1,631	1,488	1,602	1,844	1,791	2,243	1,862
Value of Physical Change in Inventories	19	102	176	42	123	-14	54	126	14	-2	-236
Non-Farm	22	40	158	15	75	67	8	112	-10	31	-220
Farm and Grain in Commercial Channels	-3	62	18	27	48	-81	46	14	24	-33	-16
Exports	3,151	3,492	3,542	3,448	3,352	3,456	3,531	3,862	3,907	4,063	3,835
Imports	-3,304	-3,814	-4,423	-4,461	-5,349	-5,566	-6,186	-6,850	-6,783	-7,074	-6,047
Residual	175	303	184	73	-150	-33	102	-45	-342	-664	-933
Gross Domestic Product In Constant (1971) Dollars	8,391	9,174	9,372	10,017	10,407	10,891	11,466	12,569	13,375	14,428	13,776

Source: Alberta Bureau of Statistics, *Alberta Economic Accounts 1982*

measure of real economic growth for the province.

First estimates show that the Alberta GDP reached \$52.2 billion in 1982 in current dollars. This represents an average compounded annual growth rate of over 19 per cent over the 1972 value of \$8.8 billion. When measured in constant

(1971) dollars, the value of real GDP for 1982 was \$13.8 billion, a real compounded average yearly growth of over 6 per cent over 1972. Both the current and constant dollar estimates indicate that growth in the Alberta economy has been very strong during the past decade.

TABLE 1.2

**ECONOMIC
ACCOUNTS -
CONSOLIDATED
INCOME AND
OUTLAY
ACCOUNTS -
ALBERTA - 1972-
1982 (MILLIONS OF
DOLLARS)**

INCOME ACCOUNT	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Wages, Salaries and Supplementary Labour Income	4 144	4 779	5 858	7 346	8 857	10 228	11 560	13 114	14 534	16 441	22 248
Military Pay and Allowances	93	107	114	135	42	147	131	137	147	155	195
Net Income of Non-Farm Unincorporated Business	484	1 412	566	654	421	710	805	881	1 009	1 170	1 116
Net Income of Farm Operators from Farm Production	322	618	811	710	504	358	686	852	977	782	564
Corporation Profits	1 498	2 202	3 111	4 051	4 730	5 140	6 718	7 789	8 801	7 889	6 146
Interest and Miscellaneous Investment Income	567	920	1 591	2 116	2 882	3 469	4 561	5 713	7 027	8 192	9 129
Inventory Valuation Adjustment	-61	-131	-245	-178	-130	-224	-298	-448	-459	-541	-298
Indirect Taxes	745	972	2 120	2 114	1 868	1 931	1 888	2 251	2 509	3 998	4 301
Subsidies	86	-116	-212	236	344	373	375	476	593	666	1 634
Capital Consumption Allowances	1 233	1 437	1 733	2 028	2 383	2 810	3 271	3 956	4 857	5 796	6 711
Business	1 084	1 269	1 523	1 781	2 107	2 502	2 913	3 543	4 380	5 219	6 033
Government	149	168	210	247	276	310	358	413	477	571	682
Residual	183	362	301	-125	-311	75	249	125	1 065	2 255	3 533
Gross Domestic Product at Market Prices	8 826	10 968	15 350	18 616	21 588	24 376	27 900	34 394	41 663	48 951	52 157
OUTLAY ACCOUNT	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Sales to Persons	4 774	5 371	6 410	7 851	9 431	10 811	12 449	14 576	17 164	20 306	22 157
Sales to Government	1 489	1 741	2 073	2 561	3 052	3 418	3 801	4 572	5 116	6 257	7 278
Gross Fixed Capital Formation	2 457	3 026	3 959	5 214	7 232	8 135	9 877	12 525	14 914	19 178	17 941
Government	291	337	489	684	697	826	913	1 078	1 432	2 207	2 735
Residential Construction	3	2	3	2	3	3	5	5	6	7	6
Non-Residential Construction	257	288	434	605	609	728	819	918	1 215	1 918	2 433
Machinery and Equipment	31	47	52	77	85	97	89	155	213	282	296
Business	2 166	2 689	3 470	4 530	6 535	7 307	8 964	11 447	13 482	16 971	15 206
Residential Construction	542	608	730	940	1 779	1 957	2 676	2 997	2 867	3 166	2 478
Non-Residential Construction	947	1 164	1 496	2 084	2 424	3 044	3 598	5 097	6 992	8 676	8 124
Machinery and Equipment	677	917	1 244	1 506	2 332	2 306	2 760	3 423	3 623	5 129	4 604
Value of Physical Change in Inventories	11	-232	236	77	261	10	85	322	140	18	191
Non-Farm	22	52	265	66	158	25	23	263	21	23	744
Farm	4	-173	71	14	108	91	104	93	119	9	48
Grain in Commercial Channels	15	7	0	25	15	44	4	34	46	32	1
Exports	2 321	4 460	7 955	9 129	9 763	11 117	12 714	16 671	21 282	23 789	25 484
Imports	3 410	4 224	5 580	6 351	7 830	9 771	11 725	14 550	15 828	18 307	16 480
Residual	184	362	301	-125	-311	74	249	124	1 065	2 254	3 532
Gross Domestic Product at Market Prices	8 826	10 968	15 350	18 616	21 588	24 376	27 900	34 394	41 663	48 951	52 157

Private and Public Investment

Investment volume is one of the key indicators of growth in an economy; even more it is an indicator of investor confidence in the security, profitability and prospects of industry in a given locale. By these criteria, Alberta has fared very well in the post-war period.

In 1950, total private and public

investment in Alberta was estimated at \$521 million with a per capita investment of about \$570. By 1980, volume of investment had risen to \$17,003 million, and per capita investment to \$7,939.

Annual investment peaked in 1981 at \$21,846 million. It has since decreased to the 1980 level due to the impact of the world wide economic recession. Despite the decrease in total volume, the per capita investment remains far higher than that of any other province.

TABLE 1.3

PRIVATE AND PUBLIC INVESTMENT IN ALBERTA - 1948-1984 (MILLIONS OF DOLLARS)

	Primary Industries and Construction	Manufacturing	Utilities & Communication	Trade Finance & Commercial Services	Housing	Institutional Services and Government Departments	Capital and Repair Expenditures		Total
							Construction	Machinery & Equipment	
1948	-	23.4	61.8	-	65.6	74.3	-	-	390.1
1949	164.8	20.6	79.2	25.9	91.1	88.0	280.5	189.1	669.6
1950	192.5	24.4	86.9	41.4	85.8	90.2	312.2	209.0	521.2
1951	234.1	45.1	97.1	54.7	77.9	125.9	379.1	255.7	634.8
1952	272.8	86.4	125.1	55.1	87.0	134.8	454.7	306.5	761.2
1953	269.0	104.1	130.0	72.1	123.0	198.9	569.5	327.6	897.1
1954	238.0	64.0	144.3	60.9	140.2	159.7	530.4	276.7	807.1
1955	308.2	8.0	43.6	59.9	140.1	188.3	636.0	282.1	918.1
1956	380.2	130.9	186.6	54.4	155.6	207.9	725.6	390.0	1,115.6
1957	336.0	82.7	210.3	64.6	154.0	223.1	707.2	363.5	1,070.7
1958	321.3	90.5	204.5	75.1	218.6	218.3	786.7	341.6	1,128.3
1959	381.5	100.1	190.5	83.5	216.8	244.2	818.7	397.9	1,216.6
1960	393.4	84.3	219.4	91.2	177.4	254.9	815.5	405.1	1,220.6
1961	443.8	56.9	242.6	79.5	195.3	251.8	876.6	393.3	1,269.9
1962	383.1	72.7	184.8	83.3	229.5	282.7	820.1	416.0	1,236.1
1963	462.1	64.8	216.7	101.2	221.8	243.6	862.0	448.2	1,310.2
1964	518.3	83.2	239.2	110.6	214.2	256.0	920.0	501.6	1,421.6
1965	644.1	105.6	283.4	119.2	215.2	296.8	1,093.5	570.8	1,664.3
1966	734.1	103.3	360.3	129.6	209.7	407.3	1,276.5	667.8	1,944.3
1967	746.7	113.4	393.6	149.2	244.6	446.6	1,347.9	746.2	2,094.1
1968	749.3	143.7	420.6	153.3	309.0	397.2	1,443.1	730.0	2,173.1
1969	842.4	135.4	438.7	196.2	400.6	386.1	1,607.4	792.0	2,399.4
1970	878.1	183.5	495.9	186.5	350.0	392.4	1,709.1	777.3	2,486.4
1971	946.1	186.5	471.6	179.7	492.3	442.0	1,845.8	872.4	2,718.2
1972	1,006.9	245.9	500.7	280.2	538.1	426.1	1,979.4	1,018.5	2,997.9
1973	1,252.5	394.1	557.2	404.4	587.6	471.9	2,333.8	1,333.9	3,667.7
1974	1,692.1	415.9	796.6	471.3	694.1	636.2	2,961.3	1,744.9	4,706.2
1975	2,290.6	441.0	1,086.9	559.5	849.4	825.3	3,920.6	2,132.1	6,052.7
1976	3,084.1	591.7	1,344.9	725.9	1,699.8	807.6	5,197.5	3,056.5	8,254.0
1977	3,523.0	661.3	1,410.1	849.3	1,833.4	971.4	6,124.5	3,169.0	9,293.5
1978	4,015.0	910.4	1,436.8	1,252.3	2,426.8	1,109.0	7,411.5	3,738.8	11,150.3
1979	5,385.4	1,072.0	1,671.4	1,994.7	2,647.0	1,412.6	9,373.8	4,809.3	14,183.1
1980	7,154.1	979.4	2,285.8	2,261.7	2,479.2	1,843.3	11,694.4	5,309.1	17,003.5
1981	8,011.8	2,297.0	3,035.8	2,960.2	2,830.0	2,711.3	14,477.6	7,368.5	21,846.1
1982	7,081.7	2,663.0	3,139.0	2,505.5	2,286.9	3,306.6	14,002.6	6,980.1	20,982.7
1983	6,743.0	2,725.5	2,725.5	1,812.6	1,798.4	3,250.6	11,805.6	6,534.9	18,340.8
1984*	7,636.7	2,488.5	2,488.5	1,575.8	1,343.5	2,924.6	10,960.7	6,162.5	17,123.2

*Forecast

Source: Statistics Canada - Private and Public Investment in Canada Cat. No's 61-205 and 61-206

The increase in both volume and annual growth rates of investment can be attributed to two major economic developments, both involving the petroleum industry, that occurred over the thirty-year span. The first was the bringing into production of the conventional oil and gas resources, and, more recently, of the reserves contained in the Athabasca oil sands. The second was the sharp and sudden rise in the unit petroleum energy prices after 1973. Both developments triggered and spurred a range of related activities: population influxes, housing and commercial booms, increased local manufacturing and processing, higher government revenues and expenditures, and the financial investments attracted by a flourishing and stable economy.

Primary industries and construction, particularly involving the petroleum mining industry, have accounted for between 28 per cent and 45 per cent of annual investments over the thirty-five year span. In recent years, manufacturing, utilities and services have been attracting increasing proportions. The proportion of investments in institutions and governmental facilities has declined from about one-fifth to about one-tenth of the annual totals.

Although precise figures are not available, the bulk of the investments in petroleum development and in manufacturing have been made by large firms. The pace of growth and volume of investments in these key industries have provided the necessity and justification for investment expenditures in other businesses and industries. The specific effects of these investments on employment and output are shown in the industry sections of this publication.

The growth rate in investment was not maintained in the early 1980's due to the impact of the world wide economic recession. However, given the world shortages of petroleum energy resources, the known volumes of petroleum components locked in the oil sands, and the related industry growth which accompanies petroleum development, it is likely that the rates and volume of investments will rebound and continue to increase in the foreseeable future. The multiplier effects of this investment will also continue to be beneficial and stimulative throughout western and central Canada.

Alberta Heritage Savings Trust Fund

The Heritage Fund was created in 1976 with the passage of the Alberta Heritage Savings Trust Fund Act. In deciding to save a portion of the provincial non-renewable resource revenues in a Heritage Fund, the Legislature recognized that Alberta conventional oil and gas resources will be depleted over time and that the revenues they generate can fluctuate with factors beyond provincial control, such as international oil and gas prices. The savings in the Heritage Fund provide the government with another source of revenue when needed. The Heritage Fund is therefore a key tool in financial management strategy.

The savings in the Heritage Fund give the government needed financial flexibility. For instance, when the Alberta economy weakened in 1982 and government resource and tax revenue actually dropped, the government had the Heritage Fund to fall back on. Since September, 1982, all the investment income of the Heritage Fund has been transferred to the provincial budget to help meet the costs of government services, including special programmes to facilitate economic recovery, and to limit the need to borrow. In 1983-84, this income of \$1.47 billion paid for these day-to-day services for the equivalent of two months out of twelve. As a result, Alberta has been able to maintain government services and to retain the lowest taxes of any province.

Until the end of the 1982 fiscal year, the Heritage Fund received 30% of the provincial non-renewable resource revenue. In 1983-84, the transfer of resource revenue was reduced to 15% as a further response to budgetary requirements. The 15% transfer amounted to \$720 million in that year.

The monies set aside in the Fund are invested for the benefit of Albertans now and in the future. By 1984, the Heritage Fund's assets had grown to \$13.7 billion, consisting of \$11.8 billion in financial assets and \$1.9 billion in deemed assets.

The Heritage Fund has five investment divisions: the Alberta Investment Division, the Capital Projects Division, the Energy Investment Division, the Canada Investment Division and the

Commercial Investment Division. The Heritage Fund Act specifies distinct investment criteria for each division. Funds not allocated to these divisions are invested in deposits and marketable securities. Authority to make investments is vested in the Legislature, the Heritage Savings Trust Fund Investment Committee (the Provincial Cabinet), or the Provincial Treasurer, depending on the nature of the investment. The Heritage Fund is held and administered by the Provincial Treasurer.

Nearly 59% of the Fund's assets -- \$8 billion -- is invested under the Alberta Investment Division. Investments must yield a reasonable return or profit and tend to strengthen or diversify the economy of Alberta. By 1984, over 90% of the Division's investments were debentures issued by provincial Crown corporations and carrying market rates of interest. These Crown corporations deliver a variety of programmes that further provincial development objectives. For instance, the Division's investments in these corporations have helped finance affordable housing, provided capital for developing farms and small businesses, and financed municipal public works.

In addition, through this Division the Heritage Fund has financed projects such as the construction of a major grain terminal at Prince Rupert, British Columbia. Built and operated by a consortium of grain co-operatives and

companies, this facility will boost Alberta grain export potential from Canada's Pacific coast by 20%. With this added capacity, the movement of Alberta grain to market will be significantly enhanced. Other investments include a 16.74% participation in the Syncrude oil sands project at Fort McMurray, Alberta and 45% ownership of the Alberta Energy Company.

Investments made through the Capital Projects Division provide long term economic or social benefits to the people of Alberta. By their nature, these investments do not necessarily yield a return to the Heritage Fund. By 1984, over \$1.9 billion had been invested in deemed assets and \$200 million in financial assets under the Capital Projects Division.

A wide range of projects have received support. For example, ongoing funding is provided to Alberta Oil Sands Technology and Research Authority which supports research activities and participates with the private sector in pilot projects to recover oil from oil sands and heavy oil deposits and to enhance recovery from conventional reservoirs. The Division has also provided a \$300 million endowment to the Alberta Heritage Foundation for Medical Research. The Foundation has been instrumental in attracting top calibre researchers and is helping Alberta to become a world class centre for medical

TABLE 1.4

**ALBERTA HERITAGE
SAVINGS TRUST
FUND -
DISTRIBUTION OF
ASSETS - 1977-1984
(MILLIONS OF
DOLLARS)**

As at March 31	1977	1978	1979	1980	1981	1982	1983	1984
Financial Assets								
Alberta Investment Division	1,551	2,266	3,157	3,140	4,524	6,335	8,158	8,079
Investments in Provincial Crown Corporations	1,254	1,817	2,629	2,649	4,003	5,783	7,603	7,409
Other Investments	297	449	528	491	521	552	555	670
Capital Projects Division								200 ^a
Energy Investment Division					25	25	25	25
Canada Investment Division	50	96	270	929	1,492	1,909	1,902	1,896
Commercial Investment Division						189	199	199
Deposits and Marketable Securities and Other Assets	581	889	1,023	1,617	1,577	1,242	1,113	1,378
	2,182	3,251	4,450	5,686	7,618	9,700	11,397	11,777
Deemed Assets								
Capital Projects Division	36	123	255	733	961	1,309	1,605	1,935
Total Assets	2,218	3,374	4,705	6,419	8,579	11,009	13,002	13,712

a) Investment in Vencap Equities Alberta Ltd
Source: Alberta Treasury



research. Other Capital Projects Division investments include agricultural research, major irrigation works, and reforestation projects.

In 1983, the Legislature approved a \$200 million loan from the Division to Vencap Equities Alberta Ltd. This new Alberta-based venture capital company is a shareholder owned corporation and operates at arm's length from the government. The company focusses its investments on business start-ups and expansions having growth prospects and competent management.

One \$25 million investment in corporate debentures has been made to date under the Energy Investment Division, which has the objective of fostering the development, transportation and processing of Canada's energy resources.

Through the Canada Investment Division nearly \$1.9 billion has been invested in debentures issued by the governments of six other Canadian provinces or their agencies. Loans were suspended in 1982 in order to make available additional funds to meet priority needs within Alberta.

The primary objective of the Commercial Investment Division is to earn a commercial rate of return in keeping with the Heritage Fund's overall savings objective. At the end of the 1983/84 fiscal year, the Commercial Investment Division had total investments (at cost) of \$199.1 million of which \$193.6 million was in Canadian equities and convertible bonds with the remainder invested in short term money market securities. The market value of the portfolio at the end of 1983-84 was \$274.9 million. The equity portfolio is diversified, representing a broad range of Canadian industrial sectors and public companies. Investments are managed on a passive basis and are limited to no more than 5 per cent of the outstanding shares of any one company.

Funds which are not immediately required under one of the five Investment Divisions are invested in a portfolio of deposits and marketable securities. As well as contributing income, these investments serve the liquidity needs of the Heritage Fund.

Alberta Financial Institutions

During the seventies and early eighties Alberta's financial infrastructure deepened and broadened rapidly as a result of very strong economic growth and the energy boom. Major national financial institutions intensified their involvement in the local economy and delegated growing decision-making responsibilities to their Alberta-based executives. In addition, there came into being a variety of locally headquartered new financial institutions. The net effect was to benefit the local economy directly through the growth of employment in the financial services sector and indirectly through the availability of better and more immediate and diversified access to financial services for local businesses.

Since 1982 however, under the impact of less buoyant economic circumstances, some consolidation and retrenchment of

the province's financial fabric has taken place, albeit at historically still high levels. Total bank assets in the province as of March 1984 remained at levels which, though marginally below those of a year earlier, were nevertheless twice those four years earlier.

The process of consolidation and rationalization on the part of both Schedule A and the foreign-owned Schedule B banks largely appears to have run its course. In the case of the former it was to some degree at least part of a nation-wide trend. In the case of the Schedule B banks, the most important fact was that with one exception they have maintained their presence in the province; the one exception involves a bank the local offices of which closed not because of local conditions but because of difficulties experienced by its parent bank in its own market territory. Even more positively, during the summer of 1984 a new Schedule A bank, headquartered in Edmonton, was successfully launched with the placement of an initial offering of shares to the public and has since commenced operations.

The Treasury Branches continued to expand operations during the last couple of years, and in the process once again demonstrated their value to local consumers, farmers, and businessmen. Established in the 1930's to supplement financial services offered by the banking

system, the organization increased its asset base by about 25% during the two year period ending March 31, 1984.

Trust companies and credit unions were adversely affected on the liability management side of their operations by events elsewhere and by the resultant national and global trend among depositors to patronize larger, seemingly higher quality financial institutions. On the asset management side of their operations, however, it was their exposure to real estate which adversely affected their credibility.

Elsewhere in the Alberta financial community the same trend prevailed: rationalization and consolidation was the order of the day and there was little inclination to launch many new initiatives. A prime exception to this trend, other than the launching of the new Schedule A bank referred to above, involved the creation, at the initiative of the provincial government, of a new quarter billion dollar venture capital fund, shares in which were bought by a broad cross section of Alberta residents.

The Alberta Stock Exchange operations in 1983 marked a reversal of the previous sharp decline in its fortunes which had commenced in 1981. Both the volume of shares traded and the value of transactions on the Exchange nearly doubled in 1983 from the level to which they had precipitously fallen in 1982.

TABLE 1.5

**CHARTERED
BANKS: ASSETS
AND LIABILITIES IN
ALBERTA - 1972-
1984 (MILLIONS
OF DOLLARS)**

31-Mar	Number of Branches	Assets			Liabilities		
		Total	Residential Mortgages	Business Loans	Total	Fixed Term Deposits	Personal Savings
1972	567	1,497	327	N/A			
1973	583	1,923	463	N/A			
1974	612	5,320	617	1,454	4,914	1,636	2,254
1975	632	6,867	745	1,826	6,669	1,957	2,793
1976	648	8,517	952	2,591	7,756	2,600	3,278
1977	683	10,691	1,107	3,560	9,188	3,179	4,037
1978	693	13,277	1,365	4,539	11,298	3,631	4,544
1979	716	17,045	1,862	5,873	13,993	5,148	5,509
1980	755	22,460	2,561	9,163	16,630	6,302	6,911
1981	811	27,734	2,503	12,399	18,863	7,088	8,107
1982	826	41,755	4,581	17,386	22,717	9,190	9,851
1983	787	45,027	4,658	17,645	22,910	8,350	10,275
1984	N/A	43,045	4,652	15,822	22,212	7,542	10,330

Source: Bank of Canada Review

TABLE 1.6

ALBERTA STOCK
EXCHANGE
VOLUMES
-1971-1983

	Number of Shares	Dollars
1971	21,248,342	11,827,435
1972	12,208,365	6,492,516
1973	10,215,318	7,123,466
1974	6,263,865	5,717,238
1975	14,298,002	17,944,573
1976	25,784,471	46,443,681
1977	31,696,480	59,080,786
1978	40,016,043	95,301,438
1979	91,063,161	239,363,804
1980	162,399,239	469,797,581
1981	178,670,364	426,806,933
1982	126,130,894	120,499,563
1983	201,802,000	226,646,000

Personal Income

Personal income, as discussed in this context, is a statistical concept useful for measuring changes over time and for making inter-regional comparisons. Since sources and methods of computation of figures are radically different, data should not be related or compared directly to the similarly titled personal income taxation statistics appearing in a subsequent section.

Personal income is defined herein as the estimated sum of wages and salary income of unincorporated businesses, investment income of persons, and government transfer payments to persons (excluding interest on the public debt and capital assistance).

Total and per capita values of personal income for Alberta, western Canada, and Canada for selected years 1935 to 1982 are shown in the

accompanying table. Figures are in current dollars and thus include the effects of inflation as well as the increases attributable to population growth and the changes in industry emphases and developments. In 1982, Alberta accounted for 10.3 per cent of the personal income of Canada and 33.7 per cent of that of western Canada.

The proportions of personal income attributable by source have changed substantially over the past 40 years as Alberta evolved from an agricultural to a more diverse industrial and commercial based economy. Despite marked growth in dollar volume, the net income of farm operators from farm production has decreased from about 25 per cent of total personal income to about four per cent. Wages and salaries now account for well over two-thirds of the total as compared to about two-fifths at the end of World War II. The proportion attributed to non-farm

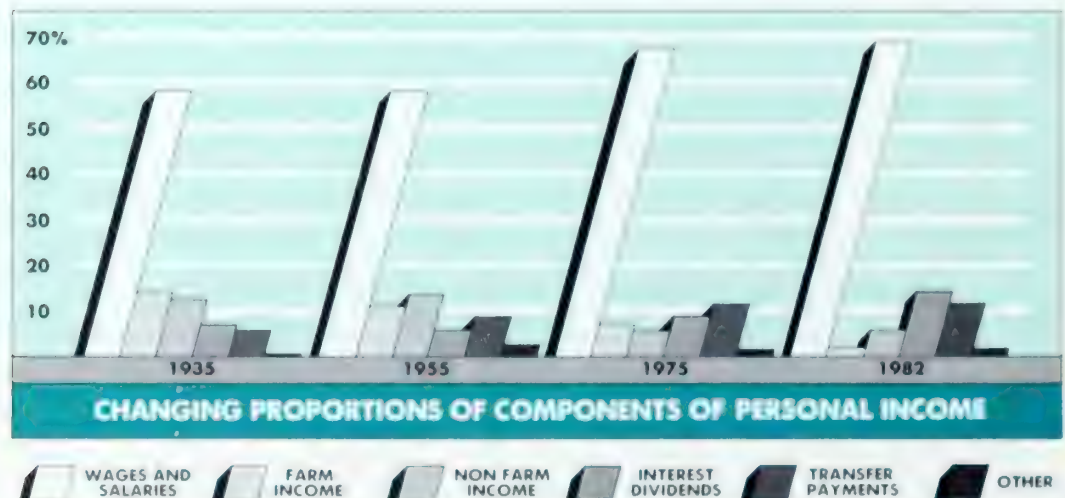


TABLE 1.7

**COMPONENTS OF
PERSONAL INCOME
- ALBERTA -
SELECTED YEARS -
1935-1982
(MONEY FIGURES
IN MILLIONS OF
DOLLARS)**

	Wages Salaries & Supple- mentary Labour Income		Net Income Received by Farm Operators from Farm Production		Net Income of Non-Farm Unincor- porated Business		Interest Dividends and Misc. Investment Income		Government Transfer Payments		Other		Total	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
1935	110	57.9	27	14.1	25	13.2	14	7.4	12	6.3	2	1.1	190	100.0
1940	147	46.7	84	26.7	46	14.6	15	4.7	12	3.8	11	3.5	315	100.0
1945	244	42.8	124	21.8	81	14.2	23	4.0	40	7.0	58	10.2	570	100.0
1950	505	52.9	176	18.4	137	14.4	45	4.7	67	7.0	25	2.6	955	100.0
1955	861	58.4	183	12.4	197	13.4	70	4.7	119	8.1	45	3.0	1,475	100.0
1960	1,298	60.8	162	7.6	264	12.4	120	5.6	238	11.2	52	2.4	2,134	100.0
1965	1,843	62.9	277	9.5	293	10.0	205	7.0	256	8.7	56	1.9	2,930	100.0
1970	3,351	67.6	219	4.4	430	8.7	351	7.1	503	10.2	99	2.0	4,953	100.0
1975	7,366	67.0	713	6.5	654	5.9	929	8.5	1,121	10.2	208	1.9	10,991	100.0
1976	8,851	70.1	479	3.8	651	5.2	1,130	8.9	1,298	10.3	219	1.7	12,628	100.0
1977	10,228	70.9	372	2.6	713	4.9	1,348	9.3	1,543	10.7	224	1.6	14,428	100.0
1978	11,360	68.0	652	3.9	805	4.8	1,873	11.2	1,795	10.7	223	1.4	16,708	100.0
1979	13,614	68.0	762	3.8	881	4.4	2,523	12.6	1,991	10.0	243	1.2	20,014	100.0
1980	16,259	68.4	794	3.3	1,009	4.3	3,069	12.9	2,353	9.9	288	1.2	23,772	100.0
1981	19,903	68.3	806	2.8	1,170	4.0	4,216	14.4	2,741	9.4	307	1.1	29,143	100.0
1982	22,248	68.5	545	1.7	1,358	4.2	4,520	13.9	3,471	10.6	353	1.1	32,495	100.0

Source: Statistics Canada - System of National Accounts - The Annual Estimates Cat. No. 13-201

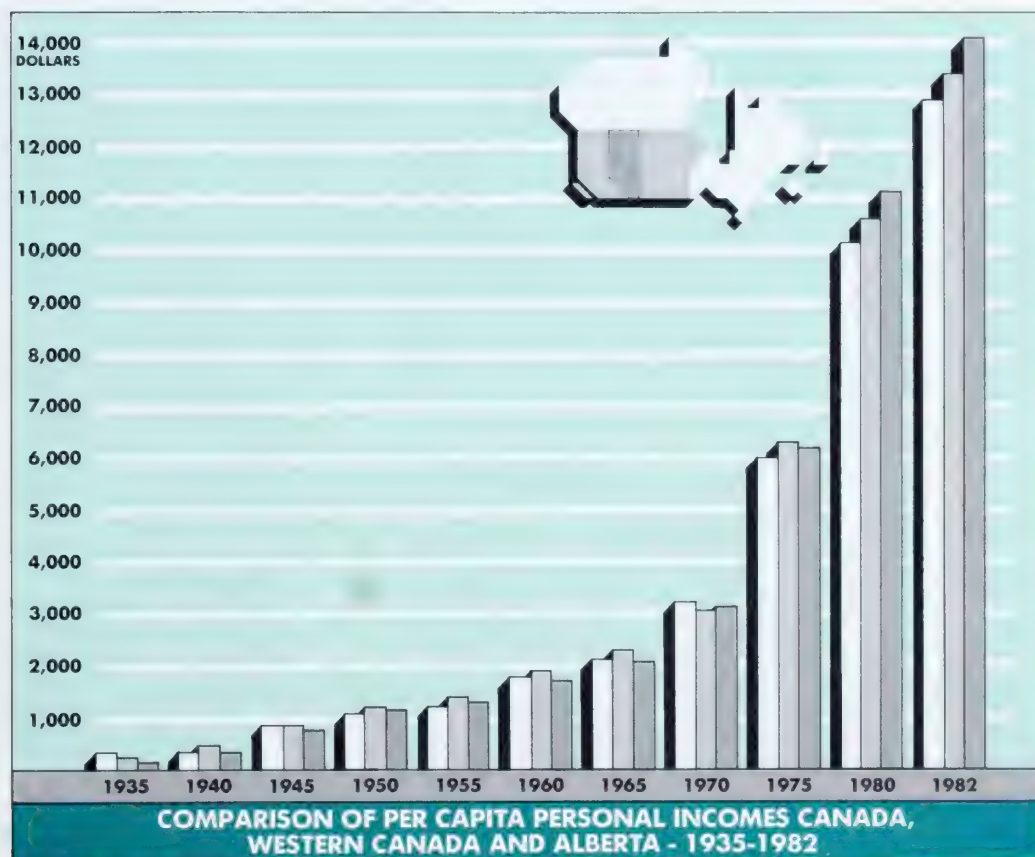


TABLE 1.8

TOTAL PERSONAL INCOME AND PER CAPITA PERSONAL INCOME: CANADA, WESTERN CANADA AND ALBERTA - 1935-1982

	Total Personal Income			Per Capita Personal Income		
	Canada (millions of dollars)	Western Canada	Alberta	Canada \$	Western Canada \$	Alberta \$
1935	3,398	879	190	313	278	348
1940	4,972	1,326	315	437	409	529
1945	6,267	1,491	570	770	747	705
1950	14,167	3,964	955	1,040	1,079	1,046
1955	21,265	5,891	1,475	1,355	1,410	1,350
1960	29,595	8,199	2,134	1,656	1,705	1,653
1961	30,104	7,869	2,199	1,651	1,624	1,651
1962	32,788	8,892	2,411	1,764	1,802	1,781
1963	34,829	9,444	2,535	1,840	1,879	1,807
1964	37,282	9,858	2,652	1,933	1,927	1,856
1965	41,071	10,962	2,941	2,091	2,107	2,028
1966	46,094	12,357	3,374	2,303	2,332	2,312
1967	50,579	13,315	3,665	2,482	2,466	2,460
1968	55,677	14,762	4,111	2,690	2,683	2,698
1969	61,804	16,329	4,589	2,943	2,914	2,944
1970	66,633	17,336	4,953	3,129	3,043	3,105
1971	74,092	19,621	5,534	3,435	3,395	3,399
1972	83,767	22,208	6,267	3,842	3,789	3,782
1973	97,832	26,954	7,471	4,438	4,528	4,422
1974	116,867	32,503	9,019	5,226	5,359	5,236
1975	136,205	38,649	10,991	6,001	6,239	6,182
1976	155,142	43,679	12,628	6,747	6,919	6,871
1977	171,516	48,482	14,428	7,370	7,529	7,542
1978	191,498	54,848	16,708	8,143	8,352	8,426
1979	215,367	62,962	20,014	9,069	9,416	9,749
1980	244,342	72,783	23,772	10,163	10,613	11,103
1981	287,476	87,888	29,143	11,810	12,477	13,028
1982	316,284	96,472	32,495	12,839	13,412	14,025

Source: Statistics Canada, *Survey of Personal Income: The Annual Personal Income Survey, 1982*.

unincorporated (i.e. smaller) businesses has been greatly reduced as larger firms make an ever-increasing impact. Government transfer payments became increasingly more important as society increasingly approved income redistribution measures of governments.

In general terms, the personal income data reflect the relative affluence of individuals in provinces or regions. The prosperity and dynamic growth of Alberta have been widely publicized over the past three decades — and they are facts. Yet there is considerable confusion as to the relative affluence of governments and that of individuals.

The average per capita personal incomes of all Canadians, western Canadians, and Albertans appear in the accompanying table. It should be particularly noteworthy that, for most of the period, the Alberta individuals' average at best closely paralleled that of all Canadians, and was below that of the four western provinces combined. Only in very recent years have there been indications that the historical relationships are changing.

Net Value of Production

In any industry, net value of production is equal to gross receipts from the sales of goods minus the cost of raw materials, fuel and electricity required for their production. As a measure of the relative performance of industries, a net value is preferable to a gross value figure because it excludes contributions made by other industries to the production process. For example, to determine the relative importance to the economy of the bakery industry one would take the total of its sales receipts and subtract the cost of such ingredients as flour, milk, eggs, and fuel and power supplies which were produced by the agricultural, electric power and petroleum industries. The bakery industry's "total receipts" figure alone would give a misleading impression as to its relative importance as compared with other industries under study. Value added and net value of production are equivalent terms.

Only those industries which produce some physical product are included in the net value of production data series. Businesses which make important contributions to the economy, but which are excluded from the series include retailers, wholesalers, service trades firms, the government, transportation industries and financial firms.

It is to be noted that net value of production should not be confused with profit since the former includes all salaries and wages, taxes, rents, overhead costs, and machinery replacement costs, as well as residual dividends and profits.

The net value of production figures in this section have been compiled to show the relative contributions of the commodity producing industries of the province for some representative years; a number of national figures are given to show differences in production patterns.

In the past 45 years there have been major changes in the structure of the Alberta economy. An analysis of the various industries shows very clearly the

TABLE 1.9

**TOTAL AND PER
CAPITA NET VALUE
OF PRODUCTION:
CANADA, WESTERN
CANADA AND
ALBERTA -SELECTED
YEARS -1935-1981**

	Net Value of Production			Per Capita Net Value of Production		
	Canada	Western Canada (millions of dollars)	Alberta	Canada \$	Western Canada \$	Alberta \$
1935	2,352.3	567.8	147.3	217	180	193
1940	3,725.9	964.7	252.7	327	298	320
1945	6,297.8	1,685.2	403.0	522	505	499
1950	10,943.8	2,957.9	750.3	798	805	822
1955	15,718.8	4,358.6	1,283.0	1,001	1,043	1,176
1960	18,981.8	5,202.1	1,535.9	1,062	1,095	1,190
1965	26,685.6	7,279.1	2,260.9	1,358	1,399	1,559
1966	29,971.1	8,338.7	2,613.6	1,497	1,574	1,786
1967	30,838.8	8,388.2	2,756.7	1,513	1,554	1,850
1968	33,012.8	8,953.8	2,970.3	1,595	1,627	1,949
1969	36,112.8	9,893.3	3,261.5	1,720	1,766	2,092
1970	36,903.0	9,793.7	3,442.9	1,733	1,719	2,159
1971	39,808.4	10,801.1	3,371.6	1,846	1,869	2,292
1972	44,324.0	12,170.0	4,360.7	2,033	2,077	2,631
1973	54,957.2	16,768.8	5,864.9	2,493	2,817	3,471
1974	68,220.6	21,350.0	8,384.7	3,050	3,520	4,868
1975	72,493.3	23,726.2	10,463.2	3,194	3,830	5,884
1976	82,248.9	28,133.8	12,466.2	3,577	4,457	6,772
1977	90,260.1	31,216.6	14,547.2	3,878	4,848	7,606
1978	103,604.6	37,262.0	17,707.2	4,406	5,674	8,929
1979	123,259.1	45,702.1	22,199.6	5,190	6,834	10,814
1980	134,578.2	50,520.3	25,141.9	5,598	7,367	11,745
1981	147,295.2	55,012.6	28,103.0	6,051	7,809	12,561

Source: Statistics Canada - System of National Accounts - Cat. No. 61-202

shift from a basically agrarian economy to one in which mining (including petroleum) is currently the predominant industry, in dollar terms.

The proportions are affected, particularly in recent years, by the high values per unit output assigned to the mining industry. Not apparent from percentage figures are the substantial increases in physical volume of output of the agricultural, manufacturing, construction or other industries, or the fact that the physical volume of output of the mining (petroleum) industry is beginning to decrease.

Between 1971 and 1981, the performance of Alberta goods-producing industries was very strong. Total net value of production in 1981 was eight times larger than in 1971; the Canada total quadrupled. The Alberta share of the Canada total doubled during this period -- from 10% to 20%. The per capita net value increased to six times its 1971 level, while the national per capita net value only tripled.

The net value of production by the main commodity producing industries of Alberta and Canada in 1981 is as shown in an accompanying table. In Alberta, manufacturing accounts for 16 per cent, construction for 23 per cent, and agriculture for 7 per cent, while the

mining industry accounts for 52 per cent. Canada figures contrast strongly, showing over 50 per cent generated by manufacturing and only about 16 per cent by mining. It is interesting to note that Alberta's net value of mineral production accounts for over one-half of the Canadian mining total. At the Canada level, agriculture accounts for 7 per cent and construction for 17 per cent.

Significant industry shifts have occurred in Alberta during the past 45 years. In 1935, agriculture accounted for well over 50 per cent of total net value; by 1981 it accounted for less than 10 per cent. The mining industry produced only 11 per cent of the net value in 1935; by 1981 the proportion exceeded 50 per cent. This dramatic change is due to the rapid growth of the petroleum industry since 1947, not to any diminution of agriculture output. Between 1971 and 1981, the mining industry share of value added increased from 40 per cent to 52 per cent, due more to the rise in oil and gas prices than to an increase in production volume.

During the period from 1971 to 1981, the financial contribution of each industry appears to have increased significantly. One must be wary of the year-to-year comparisons, however, because these dollar values include inflationary price increases and, thus, do not necessarily represent increases in real output.

TABLE 1.10

**CENSUS VALUE
ADDED IN GOODS -
PRODUCING
INDUSTRIES -
ALBERTA - SELECTED
YEARS -1935-1981
(MILLIONS OF
DOLLARS)**

	Agriculture %		Mining %		Electric Power %		Manu- facturing %		Construction %		Other* %		Total %	
1935	79.4	53.9	16.1	10.9	4.6	3.1	23.8	16.1	21.0	14.3	2.5	1.7	147.3	100.0
1945	212.7	52.9	41.7	10.3	8.2	2.0	78.5	19.5	53.0	13.1	9.1	2.3	403.2	100.0
1955	332.4	25.9	303.8	23.7	28.9	2.2	263.3	20.4	338.7	26.4	15.9	1.3	1,283.0	100.0
1965	508.6	22.5	702.2	31.1	69.4	3.1	500.6	22.1	470.8	21.1	9.3	0.4	2,260.9	100.0
1971	441.2	11.8	1,486.4	39.8	110.3	3.0	785.3	21.0	895.4	24.0	13.0	0.3	3,731.6	100.0
1976	1,082.8	8.7	6,336.7	50.9	250.0	2.0	1,804.3	14.5	2,936.9	23.6	35.5	0.3	12,446.2	100.0
1977	950.0	6.5	7,842.0	53.9	299.8	2.1	2,024.1	13.9	3,397.2	23.4	34.1	0.2	14,547.2	100.0
1978	1,362.7	7.7	9,110.5	51.4	369.0	2.1	2,544.2	14.4	4,279.4	24.2	41.4	0.2	17,707.2	100.0
1979	1,738.0	7.8	11,468.4	51.7	415.8	1.9	3,016.2	13.6	5,510.8	24.8	50.4	0.2	22,199.6	100.0
1980	1,987.7	7.9	13,734.3	54.6	462.9	1.8	3,404.7	13.6	5,502.0	21.9	50.3	0.2	25,141.9	100.0
1981	2,090.5	7.4	14,602.8	52.0	572.8	2.1	4,360.1	15.5	6,417.0	22.8	59.8	0.2	28,103.0	100.0

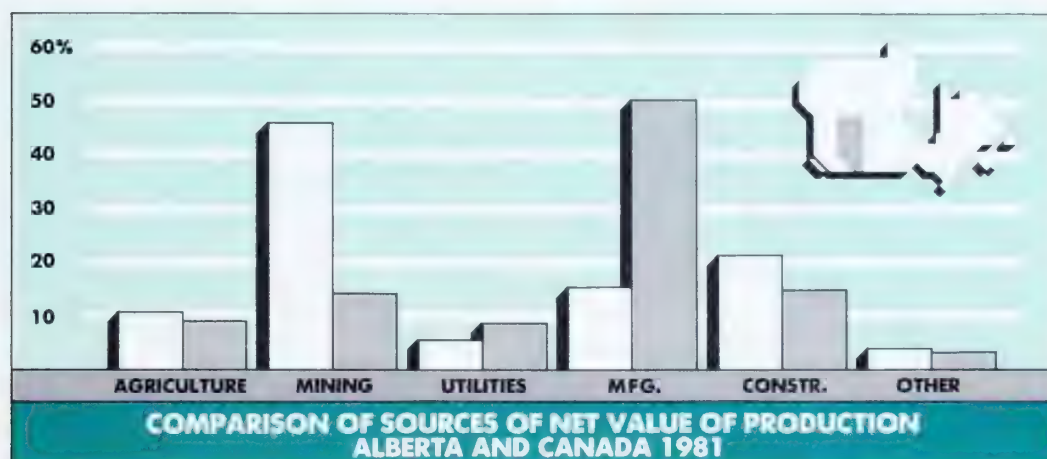
* Comprises Logging, Fisheries and Trapping

TABLE 1.11

**NET VALUE OF
PRODUCTION IN
COMMODITY
PRODUCING
INDUSTRIES -
ALBERTA AND
CANADA - 1981
(MILLIONS OF
DOLLARS)**

	Alberta		Canada	
	\$	% of Total	\$	% of Total
Agriculture	2,090.5	7.4	10,021.7	6.8
Mining	14,602.8	52.0	23,091.4	15.7
Electric Power	572.8	2.1	7,866.9	5.3
Manufacturing	4,360.1	15.5	78,443.8	53.3
Construction	6,417.0	22.8	25,058.4	17.0
Other	59.8	0.2	2,813.0	1.9
Total	28,103.0	100.0	147,295.2	100.0

Source: Statistics Canada - System of National Accounts, Catalogue No. 13-01





Industries

Manufacturing

Manufacturing is an important part of the Alberta economy, currently ranking third in net value of production. Growth of the industry has been remarkable during the last two decades. The 1983 value of shipments was approximately \$12.8 billion, a six-fold increase over the 1971 value of \$2.1 billion. Even allowing for the inflationary factor, the increase is very substantial. However, the potential is only starting to be realized as diversification is one of the goals of the provincial government.

One proposed objective of the government is to broaden and diversify the provincial economy to the greatest extent practical through the upgrading of resources, and through new economic development, in order to lessen dependence on the sale of unprocessed resources and the vagaries of world commodity markets.

Key indicators of the significance of manufacturing include the number of persons employed, the variety of finished and semifinished goods produced, the gross value of production in real terms, and the volume of new investment in plant and equipment.

In 1983, the industry provided employment for over 86,000 persons, roughly 8 per cent of the total work force.

Although the number of producing establishments has virtually remained constant since the 1950's, the smaller, inefficient, cottage-type operations are being replaced by larger organizations, often with international connections. The typical establishment is now much larger

in terms of plant size, employment and output. An increased number of oil refineries, chemical plants, wood based industries, and steel plants manufacture high-value products.

Manufacturing volume has risen steadily since the end of World War II. The provincial contribution to the total Canadian value rose from 4.1 per cent in 1971 to 6.4 per cent in 1983. The accelerated development in the past decade has been particularly notable in the iron and steel fabrication, the petroleum, and the chemical and chemical products industries. Post war increases are attributable to a number of factors including the rapid population and economic growth in western Canada, especially in Alberta and British Columbia, providing a larger and more affluent market; the high volume of construction activity (using regionally manufactured products); the broadening interdependent manufacturing base; the development of manufactured products for export markets (amounting to \$3.3 billion in 1981; the rising personal and corporate incomes; and to more intensive processing of raw material resources.

During the past decade these basic trends were enhanced by the rapid rise in energy prices, the accompanying conventional oil and gas industry boom, the large scale projects related to the Athabasca sands oil extraction plants, and the evolving chemical industries. These factors contributed to making Alberta a major centre of economic activity in Canada.

Annual investment in manufacturing plants grew rapidly from a modest \$184 million in 1970 to over \$2,000 million in

The manufacturing of All-Terrain vehicles in Alberta.

1983. Expenditures on plant and equipment rose steadily in the traditional food and beverages, wood products, metal fabricating, and non-metallic mineral products industries. More significant increases occurred in the chemicals, petroleum refining, transportation equipment, and iron and steel industries.

The range of equipment made for use in the oil and gas industry has broadened. Heavy expenditures were incurred in anticipation of construction of more synthetic and heavy crude oil plants in the Fort McMurray and Cold Lake areas, and additional world-scale petrochemical installations.

Progress in manufacturing is being achieved despite several traditional disadvantages: the relatively small domestic population of western Canada, the significant distances from major mass markets together with the accompanying high transportation costs to those markets, and the relatively small industrial base.

A number of major economic advantages offset the handicaps: the accelerating population growth in western Canada (it has more than doubled in the post war period); Alberta's individual and corporation taxation rates which are among the lowest in Canada; the transportation infrastructure which is being improved and expanded continually; and an assured and attractive supply of competitively priced hydrocarbon resources. The government's goal is to build on the significant resources and talents which are the major strengths of the province and to minimize as much as possible the inherent weaknesses.

Western Canada now has a population in excess of seven million persons; that of western United States is several times larger; and that of the so-called Pacific Rim countries many times larger again. A central location provides a favourable setting for serving all of western Canada and some of the western States. It also offers a relatively favourable base for manufacturing certain products to take advantage of the significant market opportunities which are opening up in the Pacific Rim countries. In fact many firms are successfully exporting to continental and world markets as well as servicing regional needs.

Out of country exports of manufactured products in 1981 were valued at over \$3 billion. The exports

consisted of a broad range of products, including meat, whiskey, lumber, chemicals, fertilizers, refined nickel, oilfield equipment, agricultural machinery, aircraft parts, and prefabricated buildings.

Alberta government representatives are based in London, Tokyo, Hong Kong, Houston, Los Angeles, New York, Ottawa and Toronto. They, along with the services offered by the Economic Development Department, assist businesses in taking advantage of extra-provincial market opportunities.

Diversification implies the production of additional ranges of semi-processed and finished consumer goods and includes some types of upgrading of raw resources. It may also imply a notable shift in the proportions of product-mix. Both phenomena are evident over the whole post-war period and especially the last decade.

Typical examples of new local production over the longer period include plywood and woodpulp, vegetable oils and frozen foods, oilfield steel pipe and plastic pipe, construction steels and lubricants, textiles and fibre glass, oilfield equipment and agricultural machinery.

More recently the emphasis has been on basic petrochemicals such as vinyl and poly-vinyl chlorides, vinyl acetate, ethylene dichloride, methanol, chloralkalis, benzene and styrene. Perhaps equally important have been expanded ranges of existing product lines; for example, oil field pumps, chipboards, telephones and cables, and ball valves.

Most apparent have been the changes in the overall products mix. The predominance of the food and beverage industry diminished with the rapid expansion of chemicals manufacturing, petroleum refining and production of the iron and steel goods. The altering emphasis has been related closely to the energy resources and accompanying construction industries' boom. Together they are laying the foundation for further diversification, larger ranges of consumer products, and less dependence on out-of-province sources.

In 1971, only 18 per cent of Alberta's total manufacturing shipments were accounted for by the petroleum resources-based industries. By 1983, the volume of shipments exceeded \$5.0 billion - over one-third of the total. Petroleum refining has been particularly dynamic with

production value reaching \$3.6 billion. The related chemical products industry shipments totalled over \$1.5 billion.

The food and beverage shipment value now ranks second, accounting for about 28 per cent of the total — down from the 43 per cent share recorded in 1971. Despite a reduction in the relative preponderance of the industry, the dollar value has more than quadrupled over the period.

The metal working and transportation equipment industries comprise four separate sub-groups. Their composite dollar volume of shipments increased four-fold, to \$1.6 billion over the period.

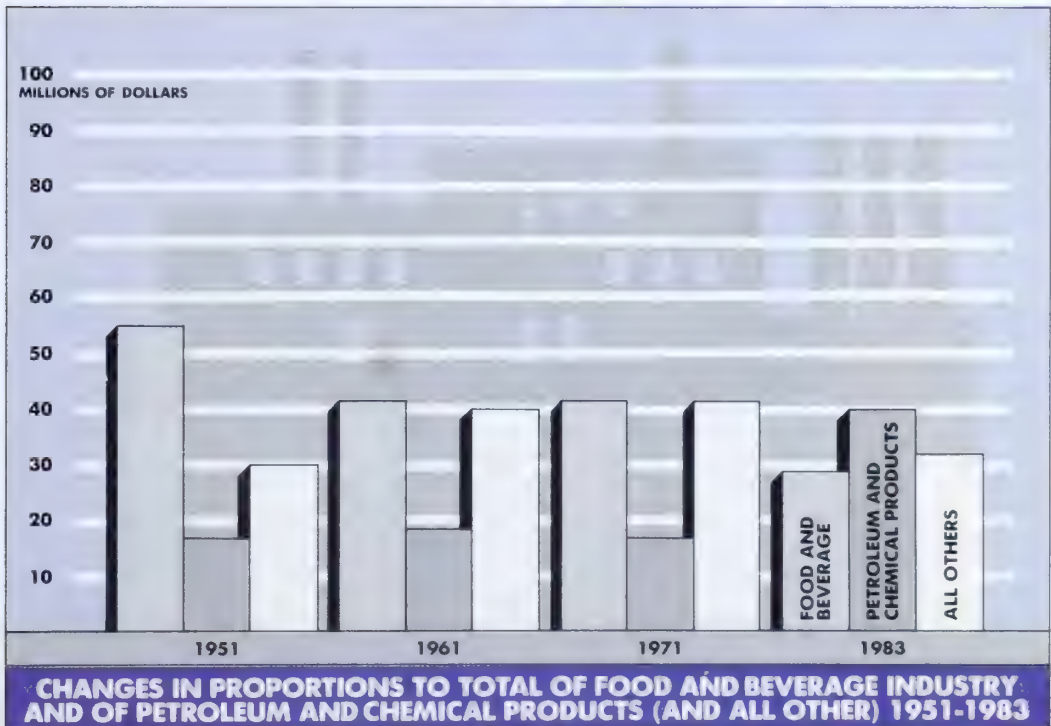
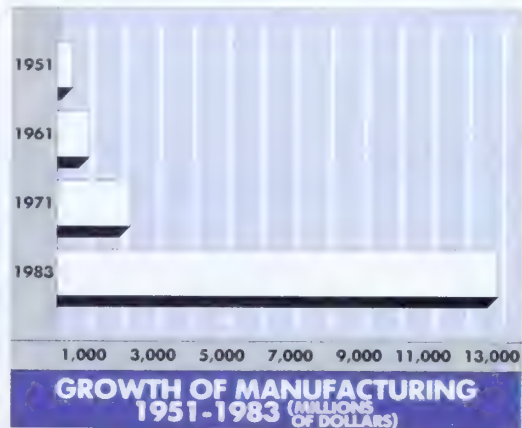
The forestry based industries — which include wood products, paper products, printing, and furniture — increased output to more than \$1.7 billion, or more than five-fold.

Although manufacturing output increased dramatically during the period, the contribution of the sector to the total net dollar value of goods production of all industries decreased from 21 per cent to 14 per cent, due solely to the phenomenal increase in the dollar value of energy mining output.

One of the government's goals is to strive to balance the opportunities for growth throughout the various regions and centres of the province. Decentralization of manufacturing activity is, therefore, encouraged by the

government whenever justified by economics and practicality. It is appreciated fully that interdependent manufacturers prefer to be in close proximity in order to minimize transportation costs of parts and materials; and that resource based industries are best sited near their sources of raw materials, and market based industries are best situated as close as possible to their markets.

Decentralization forestalls population and industrial congestion in large urban centres, and helps stimulate development and provide economic security for small centres. At present the Calgary and Edmonton areas account for over 70 per cent of the gross value of manufactured shipments; and Lethbridge, Medicine Hat and Red Deer for another 12 per cent.



Smaller centres benefit by providing over 33 per cent of the total manufacturing work force although they account for less than 20 per cent of gross production value.

In general, the bulk of production of foods and beverages, and of transportation and electrical equipment, occurs in the area south of Red Deer. North of Red Deer, the emphasis is on refined petroleum products, chemicals, metal fabrication, wood based products and textiles. Other industries such as printing, publishing, and machinery manufacture are fairly evenly distributed.

At this early stage western Canadian mass markets for final consumer products are not yet significant enough for the establishment of large scale plants; generally such secondary activity takes place close to very large population concentrations. A local western Canadian mass market can only develop over time.

Labour-intensive manufacturing activities require large pools of relatively

low-cost labour. These have been traditionally supplied by the inflow of surplus workers from farming communities or from large scale immigration. Western Canada has already depleted any excess from the rural areas; in recent years the pool has been supplemented by a large influx of individuals from other provinces and countries. The large-scale products in the energy-mining and construction industries have exerted upward pressure on wage rates, tending to keep them fairly high.

Nevertheless the development of the energy-mining sector in the past decade (not to mention the solid prospects for future development) has already induced the broadening of the manufacturing base. The increasing size of regional markets - both in terms of population and of interdependent manufacturing complexes should encourage further expansion.

TABLE 2.1

VALUE OF
MANUFACTURERS'
FACTORY
SHIPMENTS, BY
INDUSTRIAL
GROUPS - ALBERTA
- SPECIFIED YEARS -
1951-1983
(MILLIONS OF
DOLLARS)

	1951	1961	1971	1978	1979	1980	1981	1982	1983
Food & Beverages	247	394	884	2 424	2 825	3 025	3 595	3 593	3 643
Rubber & Plastic Products			29			140			
Leather				17		19	14	16	
Textile Products	3	8	15	60	62	69	107	94	111
Wood	51	40	128	388	446	434	511	343	413
Furniture & Fixtures		9	20	69	91	113	124	92	87
Paper & Allied Products	3	41	61	241	283	331	388	363	363
Printing, Publishing & Allied Products	14	32	69	241	298	370	455	459	457
Primary Metals		68	126	375	513	676	793	675	530
Metal Fabricating	21	56	138	442	582	667	837	773	634
Machinery		7	41	240	315	469	693	472	360
Transportation Equipment	17	14	88	190	169	156	199	128	103
Electrical Products		7	31	75	87	111	177	169	158
Non-Metallic Mineral Products	18	61	120	460	550	582	721	638	505
Petroleum Products	63	109	205	1 408	1 701	2 069	2 835	3 201	3 550
Chemicals & Chemical Products	10	61	125	609	755	1 113	1 472	1 341	1 498
Miscellaneous Manufacturing	9	30	16	52	64	90	104	97	92
TOTAL	458	936	2 081	7 428	8 948	10 520	13 286	12 573	12 763

Provincial government policy is to encourage local processing of resources and to sustain an economic climate for private sector profits and investment in order to maximize the opportunity for secure and skilled jobs for Albertans. This policy is being implemented in a variety of ways.

Inter-company communication is being promoted by governments and trade organizations. Programs in place acquaint local manufacturers with the materials produced by, or needed by, other local manufacturers. Attention is focused on imported items of sufficient volume to make domestic production possible. Prospective manufacturers have opportunities to produce these and intermediate goods required by other industries. Firms are urged to check local sources for goods and services, rather than assume that they can only be obtained from distant locations.

The government is committed to the promotion of manufacturing activities outside main centres in order to provide local employment, reduce the volume of imports needed, forestall population and traffic congestion, and to even out municipal tax bases.

Corporate and personal taxation rates are among the lowest in Canada. For certain types of industry property taxes are uniform irrespective of location.

Assistance is given in the negotiation of favourable freight rates to other Canadian markets and to points of export. The development of export markets is stimulated by the organization of trade missions and by stationing government representatives in strategic places to identify export markets and firms which might well invest in the province.

On a more tangible level, assistance is given for the provision of adequate road and other transportation facilities necessary for industrial expansion and access.

Provision of data and of general research and development assistance to firms or individuals is supplemented by specific import replacement studies, the results of which are issued regularly, identifying products suitable for local manufacture.

Experimental stations and research councils are assisted generously in the development of new products, and new strains of crops and livestock peculiarly suited to regional conditions.

Technological and trades training institutions are among the best and most extensive in Canada and provide a constant stream of highly skilled and well qualified personnel for the industrial and commercial firms. A government goal is to continue to upgrade work skills to create higher productivity, high job marketability and greater job satisfaction which flow from higher skill levels. Other considerations being equal, preference for local scientific, technological, and research expertise is encouraged.

On occasion, and under certain conditions, financial assistance is made available through the Alberta Opportunity Company, the Alberta Agricultural Development Corporation, and most recently through a venture capital foundation.

The cumulative impact of these policies and services is evident in the rapidly expanding industrial base of the province, particularly in recent years.

TABLE 2.2

PRINCIPAL
MANUFACTURING
STATISTICS,
SELECTED CENTRES
BY CENSUS
DIVISION.
ALBERTA, 1980

Census Division And Municipality	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
	No.	No.	No.	No.	\$000	\$000	\$000	\$000	\$000
Census Division 1	54	1 910	397	2 307	45 201	34 425	148 496	158 805	337 261
Census Division 2	134	3 474	1 077	4 551	75 015	8 210	681 827	219 382	905 629
Lethbridge Co. 26	9	216	57	273	4 604	145	15 096	7 797	24 626
Lethbridge	77	2 237	818	3 055	51 251	4 801	507 933	127 328	641 955
Coaldale	2	73	12	85	1 255		2 844	2 488	5 337
Taber	9	325	104	429	6 270	2 082	63 119	35 232	95 834
Vauxhall	3	44	17	61	939	498	8 289	2 142	10 770
Census Division 3	41	337	116	493	7 536	636	29 117	13 425	43 437
Fort Macleod	7	61	20	81	1 126	161	5 264	1 749	7 650
Claresholm	7	34	3	37	568	115	5 657	1 676	7 414
Census Division 4	5	10	4	14	172		166	344	510
Census Division 5	23	377	83	460	9 374	16 914	51 631	66 437	132 438
Linden	4	42	2	44	687	33	2 683	1 429	4 042
Census Division 6	809	20 017	5 221	25 238	461 205	35 739	1 726 017	911 523	2 649 069
High River	13	87	48	135	2 005	76	6 097	3 177	9 368
Okotoks	6	81	13	94	1 395	54	3 207	3 019	6 042
Rocky View M.D.44	6	64	13	77	1 273	49	3 512	2 566	6 114
Midnapore	743	19 325	5 046	24 371	447 444	34 733	1 695 322	884 262	2 590 756
Cochrane	10	174	12	186	3 398	412	3 169	6 915	10 569
Airdrie	8	97	62	159	2 097	118	4 036	4 811	8 420
Didsbury	4	50	2	52	1 019	72	3 376	1 705	5 046
Olds	7	35	11	46	608	64	3 620	2 052	5 756
Census Division 7	27	108	24	132	1 762	154	8 658	3 499	12 246
Stettler	8	55	10	65	862	84	4 533	1 835	6 386
Census Division 8	107	1 804	467	2 271	40 501	14 687	349 334	126 444	488 431
Innisfail	12	213	52	265	5 155	996	13 183	12 693	26 492
Red Deer	52	1 058	293	1 351	23 290	1 330	220 477	50 521	271 463
Rocky Mtn. House	5	79	9	88	1 535	262	1 707	1 599	3 517
Lacombe	9	28	18	46	515	81	4 550	1 188	5 770
Census Division 9	23	539	72	611	12 025	6 193	21 037	38 397	66 805
Census Division 10	63	1 528	255	1 783	33 312	4 376	264 678	63 195	323 657
Camrose Co. 22	4	32	13	45	760	76	3 820	1 755	5 629
Camrose	18	366	67	433	8 131	632	70 504	14 658	83 147
Lloydminster									
(Alta)	13	872	103	975	19 660	3 300	171 242	37 880	206 908
Vermilion	11	95	27	122	1 937	91	5 639	2 665	8 545
Census Division 11	919	26 381	6 497	32 878	649 611	9 269	3 485 847	561 589	5 056 466
Wetaskiwin	14	145	42	187	2 688	407	24 555	4 056	29 146
Leduc Co. 25	20	438	48	486	9 935	442	18 859	19 947	39 733
Leduc	11	48	32	80	1 119	200	2 668	2 530	5 558
Drayton Valley	5	27	22	49	733	13	635	1 460	2 107
Parkland Co. 31	15	501	78	579	13 260	7 359	24 089	38 762	70 795
Stony Plain	10	65	41	106	1 532	42	2 165	2 498	4 838
Spruce Grove	10	93	55	148	2 150	79	22 787	5 197	27 989
Strathcona Co. 20	66	5 873	626	6 499	153 054	44 279	2 117 386	469 240	2 581 037
Ft. Saskatchewan	16	1 018	175	1 193	31 036	33 717	105 739	219 400	326 657
Sturgeon M.D. 90	6	554	64	618	18 002	4 913	87 424	41 133	124 589
Edmonton	714	17 377	5 266	22 643	411 647	17 369	1 066 170	748 669	1 821 472
St. Albert	13	112	23	135	2 244	117	4 408	4 118	8 648
Census Division 12	50	429	111	540	9 191	616	21 581	22 297	44 514
Fort McMurray	16	211	44	255	4 689	375	7 405	14 667	22 369
Bonnyville	10	50	18	68	839	23	2 049	1 364	3 451
St. Paul	7	63	18	81	1 382	23	3 743	2 315	6 158

TABLE 2.2

CONTINUED

Census Division And Municipality	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
Census Division 13	36	680	125	805	16,001	1 644	34 548	23,047	55 766
Barrhead	8	83	20	103	1,712	240	9 947	4,181	14 294
Whitecourt	4	127	16	143	2 289	240	3 110	4 256	4 319
Westlock	7	41	19	60	834	30	3,232	1,994	5 253
Athabasca	6	26	7	33	499		1,262	776	2 038
Census Division 14	16	650	80	730	14,327	4 780	37 840	60 512	104,872
Census Division 15	81	2,337	433	2,770	52,042	8,987	191,027	106 911	299 675
Grande Prairie	25	606	198	804	15,282	1,487	38,796	24,953	64,602
I.D. No. 17	9	344	61	405	7,330	903	22,234	13,317	34,290
Peace River	5	108	14	122	1,891	113	5,455	4,320	9 912

Source: Alberta Bureau of Statistics

TABLE 2.3PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY,
ALBERTA, 1980

Industry Group And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
	No.	No.	No.	No.	\$000	\$000	\$000	\$000	\$000
Total All Industries	2,388	64,823	16,383	81,206	1,543,149	246,630	7,051,802	3,375,789	10,520,774
Food and Beverage Industries	394	12,438	3,695	16,133	291,064	26,321	2,458,518	559,405	3,025,456
Meat & Poultry Products Industries	77	5,023	1,512	6,535	119,627	6,918	1,514,068	130,876	1,651,158
Slaughtering & Meat Processors	72	4,636	916	5,552	105,579	6,202	1,456,082	105,033	1,565,983
Poultry Processors	5	387	596	983	14,049	716	57,986	25,842	85,175
Fruit & Vegetable Processing Inds.	5	.	.	.	.	.	.	.	.
Fruit & Veg. Canners & Preservers	3	.	.	.	.	.	.	.	.
Frozen Fruit & Vegetable Processors	2	.	.	.	.	.	.	.	.
Dairy Products Industry	38	1,765	381	2,146	39,148	3,692	222,985	78,827	305,811
Flour & Breakfast Cereal Products	5	346	60	406	7,058	600	68,630	12,356	81,137
Feed Industry	77	858	111	969	16,391	3,147	187,913	40,145	232,576
Bakery Products Industries	140	.	.	.	.	.	.	.	.
Biscuit Mfrs.	1	.	.	.	.	.	.	.	.
Bakeries	139	1,171	655	1,826	29,345	1,384	38,326	50,724	90,459
Miscellaneous Food Industries	27	1,278	521	1,799	32,566	6,009	298,847	118,460	409,310
Confectionery Mfrs.	2	.	.	.	.	.	.	.	.
Cane & Beet Sugar Processors	1	.	.	.	.	.	.	.	.
Vegetable Oil Mills	4	.	.	.	.	.	.	.	.
Misc. Food Processors, N.E.S.	20	619	359	978	16,391	2,052	87,131	50,009	134,432
Beverage Industries	25	1,664	321	1,985	39,820	3,781	91,016	109,317	201,614
Soft Drink Mfrs.	15	914	197	1,111	19,498	1,269	51,018	39,907	91,680
Distilleries	3	.	.	.	.	.	.	.	.
Breweries	5	526	58	584	14,582	965	17,999	32,325	51,907
Wineries	2	.	.	.	.	.	.	.	.

TABLE 2.3

CONTINUED

Industry Group And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
Rubber & Plastics Products Industries	62	1,224	318	1,542	26,144	2,003	79,341	63,946	140,250
Rubber Products Industries	4	353	54	407	8,358	291	12,669	12,713	26,257
Tire & Tube Mfrs.	1								
Miscellaneous Rubber Products Mfrs.	3								
Plastics Fabricating Industry, N.E.S.	58	871	268	1,139	17,786	1,713	65,672	51,244	113,993
Leather Industries	16								
Leather Tanneries	3								
Shoe Factories	1								
Leather Glove Factories	2								
Luggage, Handbag, etc. Mfrs.	10								
Misc. Leather Products Mfrs.	10								
Textile Industries	41	408	442	850	14,158	728	37,632	30,427	69,318
Wool Yarn & Cloth Mills	2								
Man-Made Fibre, Yarn & Cloth Mills	1								
Fibre & Filament Yarn Mfrs.	1								
Cordage & Twine Industry	1								
Carpet, Mat & Rug Industry	1								
Canvas Products, Cotton & Jute Bags	10								
Cotton & Jute Bags Mfrs.	1								
Canvas Products Mfrs.	9	68	126	194	3,187	75	6,301	5,266	11,070
Automobile Fabric Accessories Ind.	3								
Miscellaneous Textile Industries	25	105	180	285	3,776		5,518	4,981	10,454
Embroidery, Pleating & Hemstitching	3								
Textile Dyeing & Finishing Plants	1								
Misc. Textile Industries, N.E.S.	21	91	152	243	3,298	57	5,241	4,313	9,509
Knitting Mills	3								
Knitting Mills (Except Hosiery Mills)	3								
Other Knitting Mills	3								
Clothing Industries	32	327	1,532	1,859	24,883	384	43,745	43,675	84,268
Men's Clothing Industries	22	212	1,281	1,554	21,097	321	38,375	37,258	72,828
Men's Clothing Factories	22	273	1,281	1,554	21,097	331	38,375	37,258	72,828
Women's Clothing Industries	4								
Women's Clothing Factories	4								
Fur Goods Industry	2								
Miscellaneous Clothing Industries	4	23	35	58	632		1,965	2,265	3,939
Hat & Cap Industry	2								
Misc. Clothing Inds., N.E.S.	2								

TABLE 2.3

CONTINUED

Industry Group And Industry	Estab- lish- ments	All Employees				Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total	Salaries & Wages				
Wood Industries	219	5,794	840	6,634	117,735	8,368	251,281	177,045	433,535
Sawmills, Planing & Shingle Mills	52								
Shingle Mills	1								
Sawmills & Planing Mills	51	2,142	220	2,362	44,190	5,155	82,139	61,156	145,817
Veneer & Plywood Mills	3	286	85	371	7,859	1,029	20,112	13,348	34,483
Sash, Door & Other Millwork Plants	125	2,898	454	3,352	57,919	1,426	131,039	86,965	219,448
Sash, Door & Other Millwork, N.E.S.	58	750	103	853	14,343	525	29,050	26,111	55,412
Pre-fabricated Blds. (Wood Frame)	16	1,421	187	1,608	29,196	550	85,908	34,282	121,547
Mfrs. of Wood Kitchen Cabinets	51	727	164	891	14,381	351	16,080	26,573	42,489
Wooden Box Factories	9								
Coffin & Casket Industry	6	56	20	76	712	7	1,128	693	2,019
Miscellaneous Wood Industries	24	330	55	385	5,775	675	14,446	13,043	27,486
Wood Preservation Industry	7	178	17	195	3,350	581	10,453	9,314	19,840
Misc. Wood Industries, N.E.S.	17	152	38	190	2,426	94	3,994	3,729	7,646
Furniture & Fixture Industries	152	1,774	547	2,321	33,918	743	52,681	59,542	112,609
Household Furniture Mfrs.	113	869	313	1,182	14,425	281	23,959	22,624	46,811
Furniture Re-upholstery & Repair	76	338	111	449	4,696		6,685	6,536	13,220
Household Furniture Mfrs., N.E.S.	37	531	202	733	9,729	281	17,274	16,089	33,591
Office Furniture Mfrs.	14	513	111	624	9,843		13,368	21,436	35,229
Misc. Furniture & Fixture Mfrs.	25	392	123	515	9,650	223	15,354	15,482	30,569
Paper & Allied Industries	33	1,958	426	2,384	46,299	11,627	176,326	143,706	331,442
Pulp & Paper Mills	5	972	124	1,096	24,401	9,714	93,878	88,929	192,081
Asphalt Roofing Mfrs.	3	198	16	214	3,844	940	31,440	19,389	52,074
Paper Box & Bag Mfrs.	16								
Folding Carton & Set-up Box Mfrs.	2								
Corrugated Box Mfrs.	7	374	86	460	7,969	410	23,740	13,841	38,038
Paper & Plastic Bag Mfrs.	7	267	154	421	7,144	389	20,299	13,096	33,801
Miscellaneous Paper Converters	9								
Printing, Publishing & Allied Inds.	330	4,680	2,546	7,226	126,814	1,922	124,850	243,176	369,586
Commercial Printing	188	2,121	943	3,064	55,998	880	64,520	91,455	156,568
Platemaking, Typesetting, Etc. Ind.	30	259	171	430	6,943	108	3,958	11,386	15,440
Publishing Only	43	95	128	223	2,899		4,135	5,147	9,219
Publishing & Printing	69	2,205	1,304	3,509	60,974	934	52,237	135,188	188,360

TABLE 2.3

CONTINUED

Industry Group And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
Primary Metal Industries	28	4,013	296	4,309	93,815	16,593	408,835	247,156	675,646
Iron & Steel Mills	4								
Steel Pipe & Tube Mills	4	17	5	22	28,411	1,333	81,179	71,627	118,848
Iron Foundries	7	121	9	130	9,950	834	11,118	28,415	43,241
Smelting & Refining Aluminum Rolling, Casting & Extruding	5	145	30	175	3,002		12,814	7,012	11,111
Copper Rolling, Casting & Extruding	1								
Metal Rolling, Casting, Etc., N.E.S.	6								
Metal Fabricating Industries	354	8,553	1,095	9,648	188,384	5,769	318,789	348,149	666,483
Boiler & Plate Works	16	888	66	954	19,339	1,331	36,623	27,126	64,119
Fabricated Structural Metal Industry	32	2,141	208	2,349	52,424	1,551	67,713	55,458	115,113
Ornamental & Architectural Metal Ind.	73	1,361	326	1,687	29,144	970	63,060	58,703	111,418
Metal Door & Window Mfrs.	31	835	261	1,096	16,958	639	39,998	36,763	75,936
Ornament & Architect Metal, N.E.S.	42	526	65	591	12,186	781	23,062	21,946	45,071
Metal Stamping, Pressing & Coating	67	1,255	184	1,439	26,720	803	74,657	72,682	117,811
Metal Coating Industry	15	202	28	230	4,683	287	2,694	8,781	11,548
Metal Stamping & Pressing Industry	52	1,053	156	1,209	22,037	517	71,963	63,891	106,263
Wire & Wire Products Mfrs.	11								
Upholstery and Coil Spring Inds.	1								
Other Wire Products Industry	10	365	51	416	7,532	217	21,151	9,345	25,116
Hardware, Tool & Cutlery Mfrs.	18								
Heating Equipment Mfrs.	5	224	39	263	4,367		8,545	11,426	15,114
Machine Shops	95	1,445	117	1,562	29,967	1,118	21,619	64,438	84,917
Miscellaneous Metal Fabricating Inds.	37	691	61	752	14,540	433	21,962	29,725	61,102
Machinery Industries	147	5,919	570	6,489	129,136		248,418	132,381	468,973
Agricultural Implement Industry	20	686	58	744	15,451	543	22,303	21,927	43,148
Misc. Machinery & Equipment Mfrs.	127								
Commercial Refrig. & Air Cond. Mfrs.	1								
Office & Store Machinery Mfrs.	1								

TABLE 2.3

CONTINUED

Industry Group And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tri- city	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
Transportation									
Equipment Industries	92	2,756	492	3,248	56,903	1,447	78,497	73,949	157,047
Aircraft & Aircraft Parts Mfrs.	17	643	105	748	13,253		8,196	14,245	24,170
Truck Body & Trailer Mfrs.	55								
Truck Body Mfrs.	18	475	56	531	10,048	256	15,631	17,014	31,673
Non-Commercial Trailer Mfrs.	27	796	226	1,022	14,706	340	39,842	24,217	67,932
Commercial Trailer Mfrs.	10								
Motor Vehicle Parts & Access. Mfrs.	7	171	19	190	3,574		4,630	7,199	11,921
Boatbuilding & Repair	8	58	10	68	1,030	51	1,590	1,723	3,372
Miscellaneous Vehicle Mfrs.	5								
Electrical Products Industries	45	1,586	880	2,466	43,000	731	63,484	45,903	110,926
Mfrs. of Small Electrical Appliances	1								
Mfrs. of Lighting Fixtures	4								
Communications Equipment Mfrs.	19	383	562	945	13,549	75	23,612	17,603	41,093
Mfrs. Electrical Industrial Equipment	14	565	164	729	15,243	219	18,243	18,696	36,612
Mfrs. of Electric Wire & Cable	3								
Mfrs. of Misc. Electrical Products	4								
Battery Mfrs.	2								
Mfrs. Misc. Electrical Prods. N.E.S.	2								
Non-Metallic Mineral Products Inds.	150	5,524	774	6,298	131,793	28,094	250,980	307,253	581,869
Clay Products Mfrs.	15	332	43	375	7,428		5,274	11,551	17,055
Clay Products Mfrs. (Domestic Clay)	11								
Clay Products Mfrs. (Imported Clay)	4								
Cement Mfrs.	3								
Stone Products Mfrs.	5								
Concrete Products Mfrs.	43	1,543	105	1,648	34,152	2,500	52,387	73,248	126,753
Concrete Pipe Mfrs.	6	375	29	404	9,153	628	17,747	23,426	40,678
Mfrs. Structural Concrete Products	8	691	31	722	15,307	740	18,397	30,188	50,727
Concrete Products Mfrs. N.E.S.	29	477	45	522	9,691	1,132	16,243	19,635	35,348
Ready-Mix Concrete Mfrs.	62	1,617	178	1,795	37,736	6,030	99,094	71,831	174,939
Glass & Glass Products Mfrs.	8								
Glass Mfrs.	1								
Glass Products Mfrs.	7	43	19	62	639		1,189	729	1,851
Lime Mfrs.	2								
Misc. Non-Metallic Mineral Products	12								
Misc. Non-Metallic Mineral, N.E.S.	12	981	136	1,117	21,852	5,347	51,702	69,498	124,789

TABLE 2.3

CONTINUED

Industry Group And Industry	Estab- lish- ments	All Employees				Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total	Salaries & Wages				
Petroleum & Coal Products Industries	15	1,680	456	2,136	55,964	23,655	1,895,869	202,672	2,069,496
Petroleum Refineries	15	1,680	456	2,136	55,964	23,655	1,895,869	202,672	2,069,496
Petroleum Refining	15	1,680	456	2,136	55,964	23,655	1,895,869	202,672	2,069,496
Mfrs. of Lubricating Oils & Greases	15	1,680	456	2,136	55,964	23,655	1,895,869	202,672	2,069,496
Misc. Petroleum & Coal Products Inds.	15	1,680	456	2,136	55,964	23,655	1,895,869	202,672	2,069,496
Chemical & Chemical Products Industries	64	4,237	572	4,809	118,605	113,911	506,849	536,185	1,112,562
Mfrs. Plastics & Synthetic Resins	64	4,237	572	4,809	118,605	113,911	506,849	536,185	1,112,562
Mfrs. Pharmaceuticals & Medicines	64	4,237	572	4,809	118,605	113,911	506,849	536,185	1,112,562
Paint & Varnish Mfrs.	64	4,237	572	4,809	118,605	113,911	506,849	536,185	1,112,562
Mfrs. of Soaps & Cleaning Compounds	8	84	23	107	2,161	75	4,191	5,702	9,779
Mfrs. of Industrial Chemicals	17	1,107	381	1,488	90,286	108,023	383,132	465,483	921,520
Mfrs. of Pigments & Dry Colours	17	1,107	381	1,488	90,286	108,023	383,132	465,483	921,520
Industrial Chems. (Inorganic) N.E.S.	11	1,679	167	1,846	47,457	60,186	216,576	157,972	425,053
Industrial Chems. (Organic) N.E.S.	6	1,679	167	1,846	47,457	60,186	216,576	157,972	425,053
Miscellaneous Chemical Industries	29	438	179	617	10,861	13,697	48,412	40,623	89,035
Mfrs. of Printing Inks	1	438	179	617	10,861	13,697	48,412	40,623	89,035
Misc. Chemical Industries, N.E.S.	24	438	179	617	10,861	13,697	48,412	40,623	89,035
Miscellaneous Manufacturing Industries	211	1,676	719	2,395	37,868	493	42,649	51,202	90,359
Scientific & Professional Equipment	93	882	412	1,294	20,512	154	23,657	21,156	45,258
Instrument & Related Products Mfrs.	26	414	116	530	10,562	141	13,390	12,491	22,119
Orthopaedic & Surgical Appliance	1	11	7	18	294	14	466	642	1,098
Ophthalmic Goods Mfrs.	26	117	129	246	2,785	54	4,928	4,420	9,450
Dental Laboratories	48	294	121	415	5,871	114	4,874	8,207	13,081
Jewellery & Silverware Industry	6	56	21	77	1,291	14	1,819	1,819	3,678
Sporting Goods & Toy Industries	1	18	11	29	910	14	2,280	1,417	3,661
Sporting Goods Mfrs.	1	18	11	29	910	14	2,280	1,417	3,661
Toys & Games Mfrs.	1	18	11	29	910	14	2,280	1,417	3,661
Signs & Displays Industry	58	487	151	638	10,839	285	7,916	15,128	23,124
Miscellaneous Mfg. Industries, N.E.S.	11	168	76	244	2,408	18	5,807	6,596	12,540
Broom, Brush & Map Mfrs.	1	168	76	244	2,408	18	5,807	6,596	12,540
Sound Recording- Musical Instruments	1	168	76	244	2,408	18	5,807	6,596	12,540
Pen & Pencil Mfrs. Other Misc. Manufacturing Inds.	26	168	76	244	2,408	18	5,807	6,596	12,540

TABLE 2.4

**PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY, CENSUS
DIVISIONS,
ALBERTA, 1980**

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
		No.	No.	No.					
		No.	No.	No.	\$000	\$000	\$000	\$000	\$000
CD 1									
Total All Industries	54	1,910	397	2,307	45,201	34,425	148,496	158,805	337,261
Food and Beverage Industries	11	.	.	.	.	.	.	.	.
Rubber & Plastics Products Industries	1	.	.	.	.	.	.	.	.
Wood Industries	4	63	4	67	1,125	31	2,078	2 196	4 871
Furniture & Fixture Industries	3	.	.	.	.	.	.	.	.
Printing, Publishing & Allied Inds.	5	.	.	.	.	.	.	.	.
Metal Fabricating Industries	7	130	12	142	2,359	95	3,846	5 148	8 882
Machinery Industries	1	.	.	.	.	.	.	.	.
Transportation Equipment Industries	1	.	.	.	.	.	.	.	.
Non-Metallic Mineral Products Inds.	10	533	215	748	14,555	829	13,634	26,740	39,516
Chemical & Chemical Products Industries	4	666	58	724	16,994	32,949	76,925	98 392	205 755
Miscellaneous Manufacturing Industries	7	30	9	39	507	.	856	654	1,510
CD 2									
Total All Industries	134	3,474	1,077	4,551	75,015	8,210	681,827	219,382	905,629
Food and Beverage Industries	51	2,058	511	2,569	44,717	7,059	623,333	163,593	789,596
Rubber & Plastics Products Industries	4	21	9	30	362	5	721	305	1,030
Textile Industries	3	.	.	.	.	.	.	.	.
Wood Industries	8	41	8	49	587	5	1,612	1,048	2,658
Furniture & Fixture Industries	7	15	2	17	171	.	253	214	468
Printing, Publishing & Allied Inds.	11	195	98	293	4,475	100	2,809	7,879	10,778
Primary Metal Industries	2	.	.	.	.	.	.	.	.
Metal Fabricating Industries	15	189	10	199	3,365	62	4,107	6,715	10 469
Machinery Industries	10	367	33	400	5,854	.	9,408	11,989	20,247
Transportation Equipment Industries	6	240	62	302	5,060	134	13,464	9,318	24,566
Electrical Products Industries	2	.	.	.	.	.	.	.	.
Non-Metallic Mineral Products Inds.	8	102	6	108	2,171	248	7,053	4,360	11 422
Miscellaneous Manufacturing Industries	7	45	14	59	893	25	513	854	1,431
CD 3									
Total All Industries	41	377	116	493	7,536	636	29,117	13,425	43,437
Food and Beverage Industries	12	61	15	76	1,242	135	12,589	2,580	15 329
Leather Industries	1	.	.	.	.	.	.	.	.
Clothing Industries	3	.	.	.	.	.	.	.	.
Wood Industries	10	251	44	295	5,000	464	12,392	9,417	22,285
Printing, Publishing & Allied Inds.	4	18	7	25	305	.	205	361	566
Metal Fabricating Industries	5	10	2	12	170	13	1 191	343	1,547
Machinery Industries	1	.	.	.	.	.	.	.	.
Transportation Equipment Industries	2	.	.	.	.	.	.	.	.
Electrical Products Industries	1	.	.	.	.	.	.	.	.
Non-Metallic Mineral Products Inds.	2	.	.	.	.	.	.	.	.

TABLE 2.4

CONTINUED

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tri- city	Cost of Materials And Supplier Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
CD 4									
Total All Industries	5	10	4	14	172	-	166	344	510
Printing, Publishing & Allied Inds.	3								
Metal Fabricating Industries	1								
Transportation Equipment Industries	1								
CD 5									
Total All Industries	23	377	83	460	9,374	16,914	51,631	66,437	132,438
Food and Beverage Industries	5	12	11	23	234	4	1,191	639	2,334
Textile Industries	1								
Wood Industries	2								
Furniture & Fixture Industries	1								
Printing, Publishing & Allied Inds.	5	18	23	41	551		436	919	1,945
Metal Fabricating Industries	1								
Machinery Industries	3								
Transportation Equipment Industries	2								
Non-Metallic Mineral Products Inds.	1								
Chemical & Chemical Products Industries	2								
CD 6									
Total All Industries	809	20,017	5,221	25,238	461,205	35,739	1,726,017	911,523	2,649,069
Food and Beverage Industries	97	3,574	1,132	4,706	85,483	7,811	843,706	186,881	1,031,498
Rubber & Plastic Products Industries	26								
Leather Industries	6								
Textile Industries	16								
Knitting Mills	1								
Clothing Industries	14	41	260	301	3,317	12	6,241	6,065	11,697
Wood Industries	54								
Furniture & Fixture Industries	59								
Paper & Allied Industries	16								
Printing, Publishing & Allied Inds.	125	2,212	1,006	3,218	59,104	763	57,942	111,287	169,644
Primary Metal Industries	10								
Metal Fabricating Industries	123	3,239	464	3,703	71,785	1,822	118,856	121,814	289,767
Machinery Industries	53	1,798	142	1,940	38,944		160,597	92,867	174,464
Transportation Equipment Industries	33	828	143	971	15,889	618	20,240	24,772	45,869
Electrical Products Industries	23	345	261	606	9,075	277	27,534	18,998	46,662
Non-Metallic Mineral Products Inds.	40	1,585	139	1,724	36,096	5,375	79,959	75,724	152,685
Petroleum & Coal Products Industries	5								
Chemical & Chemical Products Industries	19								
Miscellaneous Manufacturing Industries	89	684	384	1,068	16,368	195	24,945	25,446	46,930

TABLE 2.4

CONTINUED

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
CD 7									
Total All Industries	27	108	24	132	1,762	154	8,658	3,499	12,246
Food and Beverage Industries	12	36	15	51	763	72	5,346	1,643	7,081
Wood Industries	2								
Furniture & Fixture Industries	2								
Printing, Publishing & Allied Inds.	5	10	4	14	162		129	261	391
Metal Fabricating Industries	1								
Machinery Industries	2								
Transportation Equipment Industries	1								
Non-Metallic Mineral Products Inds.	2								
CD 8									
Total All Industries	107	1,804	467	2,271	40,501	14,687	349,334	126,444	488,431
Food and Beverage Industries	25	487	112	599	10,511	1,092	190,677	22,115	213,909
Leather Industries	4								
Textile Industries	1								
Wood Industries	13	178	15	193	3,095	264	3,894	4,772	9,058
Furniture & Fixture Industries	6	78	21	99	1,245	45	1,882	1,474	3,356
Printing, Publishing & Allied Inds.	14	166	105	271	4,455	58	3,322	7,976	11,356
Metal Fabricating Industries	11								
Machinery Industries	6								
Transportation Equipment Industries	6	199	78	277	4,550	42	12,678	8,150	20,841
Electrical Products Industries	1								
Non-Metallic Mineral Products Inds.	10	245	43	288	5,932	1,257	12,195	13,674	26,673
Petroleum & Coal Products Industries	1								
Chemical & Chemical Products Industries	1								
Miscellaneous Manufacturing Industries	8	19	17	36	384	5	592	746	1,313
CD 9									
Total All Industries	23	539	72	611	12,025	6,193	21,037	38,397	66,805
Food and Beverage Industries	4	14	14	28	383	15	1,614	548	2,177
Knitting Mills	1								
Wood Industries	3								
Furniture & Fixture Industries	1								
Printing, Publishing & Allied Inds.	5	14	9	23	261		393	389	782
Metal Fabricating Industries	1								
Electrical Products Industries	1								
Non-Metallic Mineral Products Inds.	4								
Chemical & Chemical Products Industries	1								
Miscellaneous Manufacturing Industries	2								

TABLE 2.4

CONTINUED

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
CD 10									
Total All Industries	63	1,528	255	1,783	33,312	4,376	264,678	63,195	323,657
Food and Beverage Industries	19	189	64	253	4,645	825	72,378	15,476	87,134
Rubber & Plastics Products Industries	1								
Textile Industries	1								
Wood Industries	4								
Furniture & Fixture Industries	5	10	5	15	152		20	223	424
Paper & Allied Industries	1								
Printing, Publishing & Allied Inds.	9	69	61	130	1,918	21	1,654	3,021	4,696
Primary Metal Industries	1								
Metal Fabricating Industries	7								
Machinery Industries	4	149	19	168	2,456		7,245	3,824	11,385
Non-Metallic Mineral Products Inds.	8	70	6	76	1,556	181	4,547	2,893	7,611
Petroleum & Coal Products Industries	1								
Miscellaneous Manufacturing Industries	2								
CD 11									
Total All Industries	919	26,381	6,497	32,878	649,611	109,269	3,485,847	1,561,589	5,056,466
Food and Beverage Industries	112	4,695	1,469	6,164	111,463	7,262	595,879	125,984	727,448
Rubber & Plastics Products Industries	29	548	146	694	12,265	1,324	43,029	34,852	74,884
Leather Industries	5								
Textile Industries	19								
Knitting Mills	1								
Clothing Industries	14	283	1,221	1,504	21,139	372	36,661	37,186	71,302
Wood Industries	72	1,131	154	1,285	20,074	801	42,485	29,372	72,200
Furniture & Fixture Industries	58	733	247	980	14,643	400	20,215	27,605	48,865
Paper & Allied Industries	14								
Printing, Publishing & Allied Inds.	117	1,577	955	2,532	45,274	896	52,207	96,281	149,301
Primary Metal Industries	14								
Metal Fabricating Industries	168	3,925	458	4,383	88,192	2,620	153,306	183,127	336,308
Machinery Industries	64	2,766	207	2,973	62,325		122,527	130,180	247,819
Transportation Equipment Industries	37	895	125	1,020	17,990	553	24,125	26,289	51,442
Electrical Products Industries	17								
Non-Metallic Mineral Products Inds.	44								
Petroleum & Coal Products Industries	8	1,126	96	1,222	34,992	19,912	1,729,291	187,708	1,890,114
Chemical & Chemical Products Industries	34								
Miscellaneous Manufacturing Industries	92								

TABLE 2.4

CONTINUED

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tri- city	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
CD 12									
Total All Industries	50	429	111	540	9,191	616	21,581	22,279	44,514
Food and Beverage Industries	14	64	24	88	1,469	241	5,836	3,450	9,712
Clothing Industries	1	-	-	-	-	-	-	-	-
Wood Industries	7	-	-	-	-	-	-	-	-
Furniture & Fixture Industries	4	-	-	-	-	-	-	-	-
Printing, Publishing & Allied Inds.	7	66	49	115	1,517	10	1,026	2,515	3,551
Metal Fabricating Industries	4	-	-	-	-	-	-	-	-
Machinery Industries	1	-	-	-	-	-	-	-	-
Transportation Equipment Industries	2	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	8	-	-	-	-	-	-	-	-
Chemical & Chemical Products Industries	1	-	-	-	-	-	-	-	-
Miscellaneous Manufacturing Industries	1	-	-	-	-	-	-	-	-
CD 13									
Total All Industries	36	680	125	805	16,001	1,644	34,548	23,047	55,766
Food and Beverage Industries	12	91	29	120	1,776	165	11,804	2,988	14,889
Rubber & Plastics Products Industries	1	-	-	-	-	-	-	-	-
Wood Industries	7	-	-	-	-	-	-	-	-
Furniture & Fixture Industries	2	-	-	-	-	-	-	-	-
Printing, Publishing & Allied Inds.	7	-	-	-	-	-	-	-	-
Primary Metal Industries	1	-	-	-	-	-	-	-	-
Metal Fabricating Industries	2	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	3	-	-	-	-	-	-	-	-
Miscellaneous Manufacturing Industries	1	-	-	-	-	-	-	-	-
CD 14									
Total All Industries	16	650	80	730	14,327	4,780	37,840	60,512	104,872
Food and Beverage Industries	3	-	-	-	-	-	-	-	-
Wood Industries	7	-	-	-	-	-	-	-	-
Paper & Allied Industries	1	-	-	-	-	-	-	-	-
Printing, Publishing & Allied Inds.	2	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	2	-	-	-	-	-	-	-	-
Chemical & Chemical Products Industries	1	-	-	-	-	-	-	-	-

TABLE 2.4

CONTINUED

Census Division And Industry	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
CD 15									
Total All Industries	81	2,337	433	2,770	52,042	8,987	191,027	106,911	299,675
Food and Beverage Industries	17	280	76	356	6,353	1,811	51,449	21,418	71,565
Wood Industries	24	1,382	188	1,570	28,544	3,591	64,989	44,754	110,657
Furniture & Fixture Industries	4	24	7	31	119		514	441	945
Paper & Allied Industries	1								
Printing, Publishing & Allied Inds.	11	73	81	154	2,380	27	1,775	4,551	6,741
Metal Fabricating Industries	8								
Machinery Industries	2								
Transportation Equipment Industries	1								
Non-Metallic Mineral Products Inds.	8								
Chemical & Chemical Products Industries	1								
Miscellaneous Manufacturing Industries	2								

TABLE 2.5

PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY,
CALGARY,
ALBERTA, 1980

Industry Group	Estab- lish- ments No.	All Employees			Salaries & Wages \$000	Cost of Fuel & Elec- tricity \$000	Cost of Materials And Supplies Used \$000	Value Added \$000	Value of Shipments of Goods of Own Mfr. \$000
		Male No.	Female No.	Total No.					
Total All Industries	743	19,325	5,046	24,371	447,444	34,733	1,695,322	884,262	2,590,756
Food and Beverage Industries	84	3,529	1,120	4,649	84,561	7,704	835,876	183,794	1,020,406
Rubber & Plastics Products Industries	24	358	119	477	7,084	465	23,885	19,159	43,199
Leather Industries	5								
Textile Industries	15	156	175	331	5,338	200	16,096	3,579	20,867
Knitting Mills	1								
Clothing Industries	14	41	260	301	3,317	12	6,241	6,065	11,697
Wood Industries	44	1,310	265	1,575	27,555	549	53,437	49,728	103,401
Furniture & Fixture Industries	57	797	205	1,002	15,149	234	26,160	26,596	52,133
Paper & Allied Industries	15	580	211	791	13,892	1,439	53,211	36,701	91,661
Printing, Publishing & Allied Inds.	120	2,195	993	3,188	58,785	763	57,384	110,759	168,608
Primary Metal Industries	9								
Metal Fabricating Industries	118	3,173	460	3,633	70,589	1,766	117,450	118,937	235,985
Machinery Industries	50	1,707	136	1,843	36,883		96,657	78,266	166,195
Transportation Equipment Industries	24	760	117	877	14,533	569	16,825	22,929	40,674
Electrical Products Industries	23	345	261	606	9,375	277	27,536	18,998	46,662
Non-Metallic Mineral Products Inds.	35	1,550	137	1,687	35,359	5,349	77,862	69,390	149,138
Petroleum & Coal Products Industries	5								
Chemical & Chemical Products Industries	18	763	98	861	19,041	9,335	76,283	43,369	129,282
Misc. Manufacturing Industries	82	667	360	1,027	15,502	188	24,236	24,249	45,021

TABLE 2.6

**PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY,
EDMONTON
(METRO), ALBERTA,
1980**

Industry Group	Estab- lish- ments	All Employees			Salaries & Wages	Cost of Fuel & Elec- tri- city	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total					
		No.	No.	No.					
	No.	No.	No.	No.	\$000	\$000	\$000	\$000	\$000
Total All Industries	825	25,025	6,166	31,191	617,556	100,681	3,386,424	1,485,818	4,871,248
Food and Beverage Industries	91	4,543	1,423	5,966	108,509	6,691	549,085	119,577	673,520
Rubber & Plastics Products Industries	27	523	128	651	11,733	1,234	41,892	34,126	72,855
Leather Industries	4								
Textile Industries	18	162	163	325	5,581	488	17,710	24,289	42,070
Knitting Mills	1								
Clothing Industries	14	283	1,221	1,504	21,139	372	36,661	37,186	71,302
Wood Industries	60	1,038	141	1,179	18,817	767	40,524	27,731	68,542
Furniture & Fixture Industries	55	728	244	972	14,559	400	20,071	27,412	48,528
Paper & Allied Industries	13	452	99	551	9,262	1,312	28,339	19,687	49,574
Printing, Publishing & Allied Inds	105	1,496	867	2,363	43,152	868	50,232	92,423	143,440
Primary Metal Industries	14	2,423	196	2,619	59,089	13,212	227,584	165,464	409,095
Metal Fabricating Industries	153	3,630	421	4,051	81,637	2,402	143,177	169,974	312,917
Machinery Industries	58	2,609	194	2,803	58,657		114,449	122,570	231,268
Transportation Equipment Industries	32	815	107	922	16,436	504	20,054	23,732	44,690
Electrical Products Industries	15	366	89	455	9,353	156	12,127	11,251	22,823
Non-metallic Mineral Products Inds.	36	1,896	173	2,069	42,859	7,008	93,489	114,661	216,266
Petroleum & Coal Products Industries	8	1,126	96	1,222	34,992	19,912	1,729,291	187,708	1,890,114
Chemical & Chemical Products Industries	31	2,241	312	2,553	66,451	43,388	242,436	281,667	528,211
Miscellaneous Manufacturing Industries	90	612	223	835	13,182	265	15,036	22,749	37,726

Source: Alberta Bureau of Statistics

TABLE 2.7

PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY,
LETHBRIDGE,
ALBERTA, 1980

Industry Group	Estab- lish- ments	All Employees				Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total	Salaries & Wages				
		No.	No.	No.	No.	\$000	\$000	\$000	\$000
Total All Industries	77	2 237	818	3 055	51 251	4 801	507 933	127 328	641 955
Food and Beverage Industries	29	1 549	389	1 938	34 483	4 152	479 645	98 387	583 271
Rubber & Plastics Products Industries	1	-	-	-	-	-	-	-	-
Textile Industries	2	-	-	-	-	-	-	-	-
Wood Industries	3	-	-	-	-	-	-	-	-
Furniture & Fixture Industries	7	15	2	17	171	-	253	214	468
Printing, Publishing & Allied Inds.	5	-	-	-	-	-	-	-	-
Primary Metal Industries	1	-	-	-	-	-	-	-	-
Metal Fabricating Industries	10	150	8	158	2 815	62	3 349	5 955	8 951
Machinery Industries	5	62	4	66	1 102	-	1 516	1 509	3 176
Transportation Equipment Industries	2	-	-	-	-	-	-	-	-
Electrical Products Industries	1	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	5	73	5	78	1 574	211	5 720	3 471	9 164
Miscellaneous Manufacturing Industries	6	-	-	-	-	-	-	-	-

TABLE 2.8

PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY,
MEDICINE HAT &
AREA, ALBERTA,
1980

Industry Group	Estab- lish- ments	All Employees				Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total	Salaries & Wages				
		No.	No.	No.	No.	\$000	\$000	\$000	\$000
Total All Industries	51	1 899	393	2 292	45 019	34 425	148 275	158 526	336 761
Food and Beverage Industries	10	202	38	240	4 171	306	38 635	10 243	48 917
Rubber & Plastics Products Industries	1	-	-	-	-	-	-	-	-
Wood Industries	3	-	-	-	-	-	-	-	-
Furniture & Fixture Industries	3	-	-	-	-	-	-	-	-
Printing, Publishing & Allied Inds.	4	117	40	157	2 348	47	1 792	6 002	7 869
Metal Fabricating Industries	7	130	12	142	2 359	95	3 846	5 148	8 882
Machinery Industries	1	-	-	-	-	-	-	-	-
Transportation Equipment Industries	1	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	10	533	215	748	14 555	829	13 634	26 740	39 516
Chemical & Chemical Products Industries	4	666	58	724	16 994	32 949	76 925	98 392	205 755
Miscellaneous Manufacturing Industries	7	30	9	39	507	-	856	654	1 510

TABLE 2.9

**PRINCIPAL
MANUFACTURING
STATISTICS BY
INDUSTRY, RED
DEER, ALBERTA,
1980**

Industry Group	Estab- lish- ments	All Employees				Cost of Fuel & Elec- tricity	Cost of Materials And Supplies Used	Value Added	Value of Shipments of Goods of Own Mfr.
		Male	Female	Total	Salaries & Wages				
		No.	No.	No.	No.	\$000	\$000	\$000	\$000
Total All Industries	52	1,058	293	1,351	23,290	1,330	220,477	50,521	271,463
Food and Beverage Industries	11	434	85	519	9,367	956	180,416	19,754	201,080
Leather Industries	2	-	-	-	-	-	-	-	-
Wood Industries	3	-	-	-	-	-	-	-	-
Furniture & Fixture Industries	3	-	-	-	-	-	-	-	-
Printing, Publishing & Allied Inds.	6	124	87	211	3,604	42	2,557	6,799	9,397
Metal Fabricating Industries	7	85	11	96	1,692	84	13,624	7,213	20,341
Machinery Industries	5	111	8	119	2,013	-	4,579	3,571	8,035
Transportation Equipment Industries	6	-	-	-	-	-	-	-	-
Electrical Products Industries	1	-	-	-	-	-	-	-	-
Non-Metallic Mineral Products Inds.	3	-	-	-	-	-	-	-	-
Miscellaneous Manufacturing Industries	5	9	6	15	169	1	266	359	627

Source: Alberta Bureau of Statistics

TABLE 2.10

**ANNUAL
INVESTMENT IN
MANUFACTURING,
BY INDUSTRIAL
GROUP - ALBERTA -
1950-1984
(MILLIONS OF
DOLLARS)**

	Food & Beverages	Iron & Steel Products	Wood	Transport- ation Equipment	Metal Fabricating	Non- metallic Mineral Products	Petroleum Products	Other	Total
1950	7.5	-	-	0.7	-	-	6.7	9.5	24.4
1951	8.4	-	-	0.7	-	-	14.4	21.6	45.1
1952	6.5	-	-	1.1	-	-	10.6	68.2	86.4
1953	9.1	3.0	-	1.4	-	4.7	6.0	79.9	104.1
1954	9.6	1.9	-	1.2	-	4.5	21.9	24.9	64.0
1955	8.0	3.3	-	0.9	-	12.9	24.4	28.5	78.0
1956	10.3	10.9	5.6	1.4	-	16.1	23.6	98.9	166.8
1957	8.5	6.8	3.6	1.6	-	5.3	19.9	65.3	111.0
1958	9.3	3.6	2.5	1.7	-	5.3	45.6	73.4	141.4
1959	10.6	8.9	3.7	1.1	-	11.6	35.8	74.2	145.8
1960	11.7	-	2.9	-	2.6	12.4	8.7	54.7	93.0
1961	12.2	-	2.5	-	1.7	7.2	3.9	33.3	60.8
1962	14.7	-	3.1	-	2.2	7.2	6.1	45.5	78.8
1963	13.5	-	3.9	-	1.9	9.7	4.4	35.8	69.2
1964	14.0	-	4.0	-	2.5	6.8	5.1	55.9	88.3
1965	15.0	-	4.3	-	3.1	10.2	3.8	78.0	109.4
1966	16.6	-	4.2	-	3.6	12.3	4.2	66.6	107.5
1967	21.2	-	7.3	-	3.4	13.1	-	68.4	113.4
1968	19.5	-	8.3	-	3.1	8.9	-	103.9	143.7
1969	22.4	-	7.8	-	4.7	12.1	-	88.4	135.4

TABLE 2.10

CONTINUED

	Food & Beverages	Iron & Steel Products	Wood	Transport- ation Equipment	Metal Fabricating	Non- metallic Mineral Products	Petroleum Products	Other	Total
1970	31.7		8.6		4.1	12.0		127.1	183.5
1971	33.2		16.5		4.8	13.2		119.3	186.5
1972	34.7		16.8		6.8	15.3		172.3	245.9
1973	39.7		18.7		7.6	22.2		305.9	394.1
1974	49.1		14.4		10.0	46.1		296.3	415.9
1975	60.4		25.5		12.5	37.4		305.2	441.0
1976	60.2		38.0		12.7	48.9		431.9	591.7
1977	78.3		23.2		8.2	71.5		480.1	661.3
1978	74.2		26.0		7.9	72.5		729.8	910.4
1979	72.7		47.4		8.1	154.6		789.2	1,072.0
1980	89.4		49.4		23.8	152.9		696.3	1,011.8
1981	79.0		72.8		26.3	119.4		1,576.1	1,873.6
1982	105.4		31.1		23.3	98.8		2,431.3	2,689.9
1983	127.3		39.8		19.6	60.0		1,817.8	2,064.5
1984	121.2		42.0		31.6	49.3		910.0	1,154.1

Agriculture

Agricultural land is one of Alberta's great natural resources. Nearly 20 million hectares are used in crop and livestock production with approximately 11 million hectares classified as cultivated. In addition, it is estimated another 9 million hectares could be brought under cultivation and added to the present farmland inventory. Many thousands of acres of this land have been made fertile through the establishment of irrigation districts. More are being added annually as the areas under irrigation spread.

With such prime agricultural land, Alberta has developed one of the most productive agricultural economies in the world. Alberta produces 20 per cent of the total Canadian agricultural output with approximately 8 per cent of the country's population. In view of Alberta's small population and food consumption, export marketing of agricultural products is of prime importance. Present and potential markets are constantly being scrutinized by marketing specialists.

The trend is to larger, more viable farms through consolidation of existing operations. Twenty years ago the average farm size was 223 hectares; at present it is about 350 hectares. The increase in farm size and the steady upward trend in farm input costs have forced farmers to be more

efficient, reducing unit production cost and thus competing favourably in present markets. Total farm capital in 1981 was estimated at \$36 billion, representing an average investment per farm of \$630,000.

World demand for an ever-increasing variety of agricultural commodities is being met by Alberta farmers who diversify their production, add new crops or alter existing ones by changing varieties. For example, while canola was virtually unknown to Alberta farmers 20 years ago, today canola production exceeds a million tonnes annually.

Most of the cultivated area in Alberta is seeded to wheat, barley, tame hay, canola, oats, mixed grains, rye and flaxseed in that order. Receipts from the sale of wheat, oats, barley, canola and flaxseed account for over 90 per cent of the total farm cash receipts from crops; wheat sales consistently predominate in value. The lower cash receipts from barley reflect the relatively large volume of barley fed to livestock.

Specialty crops, which include dehydrated alfalfa, sugar beets, mustard seed, dry beans, vegetables, potatoes, forage seed, and honey are becoming more promising. Producers of specialty crops are relatively few in number and usually have acquired expertise in growing and marketing. Irrigated areas in southern

TABLE 2.11

**FARM CASH
RECEIPTS FROM
FARM OPERATIONS
- ALBERTA -
1971-1983
(MILLIONS OF
DOLLARS)**

	1971	1976	1977	1978	1979	1980	1981	1982	1983
Wheat	128.9	342.2	338.9	290.5	372.2	585.9	917.8	847.6	869.7
Wheat, CWB Payments (1)	18.5	74.1	21.7	20.9	76.2	70.4	233.0	110.4	131.8
Oats	8.2	24.2	20.4	15.6	14.3	27.5	25.4	24.1	21.4
Oats, CWB Payments (1)	.3	3.0	3.8	1.8		.0		3	1.1
Barley	77.9	213.4	160.9	168.1	222.3	292.2	414.2	407.8	385.0
Barley, CWB Payments (1)	7.6	18.3	50.8	37.5	20.5	18.9	48.8	55.6	41.9
Western Grain Stabilization Payments	n a	n a	n a	27.6	59.6				
CWB Cash Advances	17.8	29.9	30.2	26.2	26.0	20.5	77.5	81.4	72.0
CWB Cash Advance Repayments	-36.3	-14.4	-31.6	-24.8	-36.4	19.4	-47.6	-76.1	-85.9
Deferred Grain Receipts		-128.2	-110.4	-73.0	-78.6	-143.5	-200.4	-168.7	-176.8
Liquidation Deferred Grain Receipts		153.9	128.2	110.4	73.0	78.6	143.5	200.4	168.7
Crop Insurance Payments	2.4	16.8	38.8	22.5	24.8	32.9	27.4	82.0	100.1
Rye	2.4	8.8	6.8	7.0	12.5	30.5	29.9	19.1	14.1
Flaxseed	12.5	12.4	9.7	9.1	17.8	29.1	16.0	14.3	16.6
Canola	45.7	80.5	183.2	236.7	329.3	305.2	278.7	241.5	322.3
Sugar Beets	10.6	20.8	17.1	-17.2	21.2	44.8	38.3	18.6	26.9
Potatoes	7.7	13.5	14.0	12.8	15.0	17.9	23.0	25.3	23.9
Vegetables	2.9	7.5	8.2	8.7	11.1	14.2	15.8	15.3	16.5
Floriculture & Nursery		10.6	14.2	15.4	19.4	23.8	22.7	26.4	27.5
Other Crops	11.1	19.3	20.7	24.3	25.3	32.6	41.5	32.6	41.6
Total Crops	318.2	916.6	926.3	954.6	1225.5	1462.1	2105.5	1957.9	2018.4
Cattle	282.3	618.9	673.8	897.0	1145.8	1164.1	1165.9	1075.1	1073.3
Calves	8.0	19.0	22.2	43.9	33.1	35.4	20.9	26.1	20.3
Hogs	78.6	111.3	113.5	149.1	162.1	166.3	188.0	220.0	199.3
Sheep & Lambs	1.7	4.2	3.0	2.8	3.3	4.2	4.5	5.3	5.2
Dairy Products	46.8	92.7	99.4	106.7	123.1	148.3	174.0	208.9	209.3
Poultry	22.5	41.0	44.8	48.6	61.2	64.1	78.3	81.0	80.4
Eggs	13.9	25.3	25.9	26.9	31.4	36.2	45.6	42.7	44.6
Other Livestock & Products	9.4	15.8	18.5	22.3	26.8	27.4	29.2	26.7	27.4
Total Livestock & Products	463.3	928.2	1001.1	1297.3	1586.8	1646.0	1706.4	1685.9	1659.8
Forest & Maple Products	.5	.8	.7	.9	1.1	2.5	2.5	2.5	2.7
Dairy Supplementary Payments	6.7	17.3	17.2	17.7	14.8	15.6	17.3	17.9	18.2
Deficiency Payments (2)	.6	3.9	16.6	13.4	1.7	4.2	14.2	2.0	3.6
Provincial Income Stabilization Program		41.9					2.6	.9	2.0
Cash Receipts From Farming Ops.	789.3	1908.8	1961.9	2283.9	2829.9	3130.4	3848.5	3667.0	3704.7
Supplementary Payments (3)	5.6					12.6	30.6	141.6	
Total Cash Receipts	795.0	1908.7	1961.9	2283.9	2829.9	3143.0	3879.1	3808.6	3704.7

(1) Represents participation payments made by the Canadian Wheat Board direct to producers on crops delivered in previous years

(2) Payments made under the provisions of the Agricultural Stabilization Act

(3) Payments made under the provisions of the Prairie Farms Assistance Act and Lower Inventory for Tomorrow (LIFT) program

Source: Statistics Canada, Farm Net Income, Cat. No. 21-202

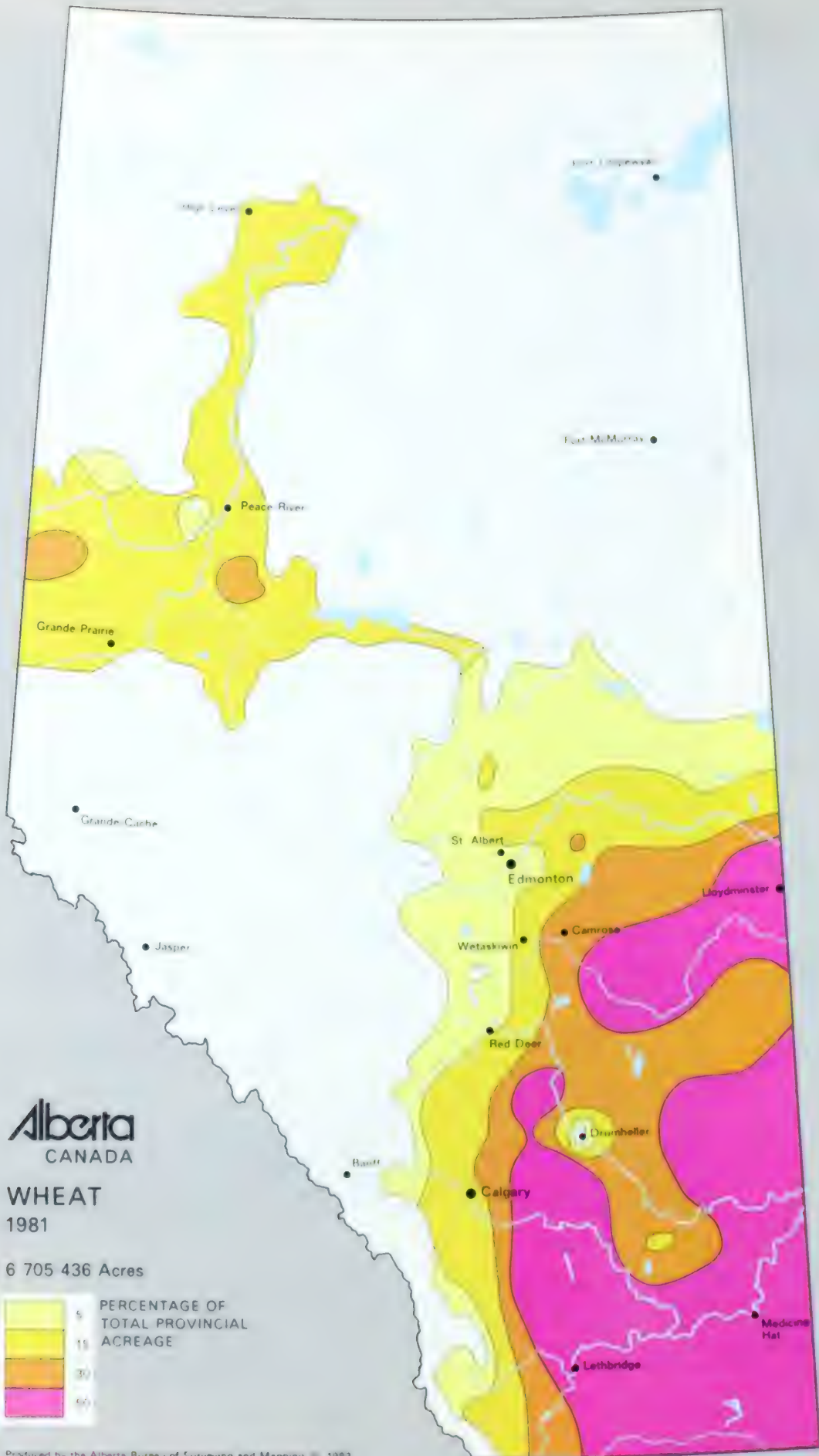


TABLE 2.12

**INCOME OF FARM
OPERATORS FROM
FARMING
OPERATIONS -
ALBERTA - 1971
AND 1978-1983
(MILLIONS OF
DOLLARS)**

	1971	1978	1979	1980	1981	1982	1983
Cash Receipts	789.3	2283.4	2829.9	3130.4	3848.5	3667.0	3704.7
Income-in-Kind	16.1	30.9	36.1	39.8	40.6	37.1	36.2
Supplementary Payments	5.6			12.6	30.6	141.6	
Realized Gross Income	811.1	2314.7	2866.0	3182.8	3919.7	3845.7	3740.9
Operating and Depreciation Charges	605.0	1798.2	2219.0	2579.0	3156.0	3178.3	3133.4
Realized Net Income	206.1	516.5	647.0	603.8	763.7	667.4	607.5
Value of Inventory Charges	17.1	98.5	73.0	151.2	48.8	-43.9	-211.6
Total Gross Income	828.2	2413.2	2939.0	3334.0	3968.5	3801.8	3529.3
Total Net Income	223.2	615.0	720.0	755.0	812.5	623.5	395.9

Source: Statistics Canada: Farm Net Income, Cat No. 21-202

Alberta are among the leading districts of specialty crop production and, as irrigation continues to expand, undoubtedly so will the production of these crops. High summer temperatures and a long growing season make possible the production of many crops that cannot be grown successfully in central and northern areas.

Ample soils of suitable textures are available for growing vegetables in increasing variety and volume, filling local demand for consumption and canning. Progress has been made in solving problems associated with cooling, processing, grading, packaging and storage, extending the period during which quality can be maintained. Varieties of green peppers and tomatoes, suited to the climatic conditions, have been developed and are appearing throughout local markets. Locally grown carrots, turnips, and potatoes are now marketed most of the year. Nevertheless, the vegetable industry has to contend with stiff competition from American producers. Vegetable production is very seasonal. Storage, because of the colder climate, is also more expensive. Although self-sufficiency is an objective, the regional population is not large enough to support a large industry. The trend elsewhere has been toward more vertical integration in which producers add processing and packaging to their operations and this is likely to be paralleled in Alberta.

The use of fertilizer has increased substantially over the past 25 years. Initial acceptance of fertilizer occurred during the early 1950's when annual use was in the 27,000 - 36,000 tonne range. Fertilizer sales soared to an annual use of over 800,000 tonnes but volume usage is

affected by the changes in the grain market. There is a trend toward more convenience and efficiency through the use of bulk fertilizer.

Alberta is a net importer of herbicides and insecticides. The broadleaf herbicide 2,4-D and a drill box treatment for cereal grains are being produced locally. The use of chemicals has increased but, as with fertilizers, sales are affected by the buoyancy of the grain market.

A major portion of the increased capital involved in agriculture continues to be directed towards increasing livestock production. Alberta maintains the largest livestock population of the western provinces, accounting for 51 per cent of the cattle and calves, 41 per cent of the hogs and nearly 58 per cent of the sheep and lambs. The expansion of cattle feeding and slaughtering facilities and improved refrigerated transportation equipment have resulted in an increase in the proportion of livestock locally processed.

During the past 25 years there have been three major "cattle cycles". The last two have had a considerable effect on farming communities. After each contraction-expansion phase, herd inventories have been higher than when the cycle started. Twenty-five years ago Alberta's annual slaughtering totalled slightly more than 250,000 head of cattle and calves; current cattle slaughterings exceed 1.2 million head. Most of the beef cattle are raised on mixed farms in central and northern Alberta. Of the 58,000 farms in the province, 40,000 have cattle. For many mixed farmers, cattle are a complementary enterprise with animals pasturing on the land than cannot be cropped. Hay and pastures are part of

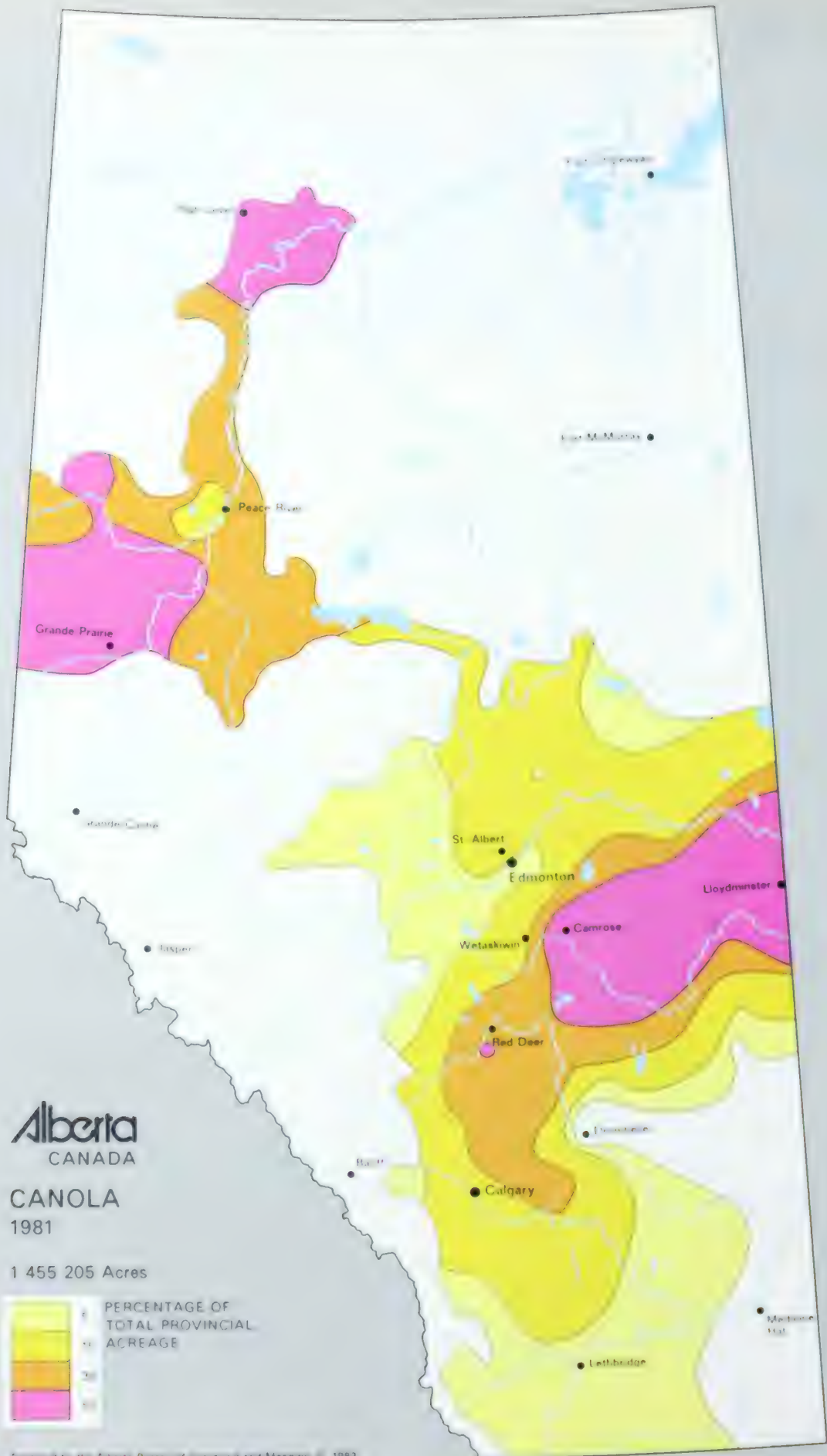


TABLE 2.13

**FARM OPERATING
EXPENSES AND
DEPRECIATION
CHARGES -
ALBERTA - 1971
AND 1976-1983
(MILLIONS OF
DOLLARS)**

	1971	1976	1977	1978	1979	1980	1981	1982	1983
Operating Expenses									
Taxes	20.4	26.7	28.4	31.2	31.1	35.3	40.2	49.7	52.6
Gross Farm Rent	31.4	74.3	76.6	96.9	118.4	145.7	155.4	167.0	165.6
Wages	39.5	81.7	89.3	97.4	105.5	127.6	164.5	182.3	190.9
Interest and Indebtedness	57.5	159.4	164.6	208.1	307.3	362.7	498.9	439.4	365.5
Fuel and Lubricants	58.2	105.9	118.5	126.9	151.2	176.9	254.8	282.0	312.2
Machinery Repair & Other Expenses	72.4	156.7	158.8	168.3	17.8	217.9	259.9	256.0	257.3
Fertilizer & Limestone	30.0	107.2	114.7	142.4	179.2	202.9	280.3	279.0	262.0
Other Crop Expenses	22.3	59.8	63.4	83.2	102.4	117.2	147.6	153.0	159.3
Feed	50.7	139.6	151.1	135.1	168.5	196.7	260.0	235.6	214.4
Other Livestock Expenses	25.9	72.0	85.2	120.0	175.2	167.1	134.3	130.4	125.1
Repairs to Buildings	12.4	38.7	31.8	33.4	37.5	39.2	50.7	50.0	53.6
Electricity & Telephones	21.4	34.0	38.7	42.3	50.5	52.4	62.4	65.5	
Miscellaneous	42.7	110.3	110.3	99.6	116.6	142.6	188.1	193.8	211.7
Total Operating Expenses	484.7	1166.3	1231.7	1384.7	1715.2	1982.3	2487.1	2480.6	2435.7
Depreciation Charges	120.3	309.7	358.4	413.5	503.8	596.7	668.9	697.7	697.7
Buildings	16.0	47.0	55.0	64.7	91.1	115.1	126.1	125.6	117.2
Machinery	104.3	262.8	303.4	348.8	412.7	481.6	542.8	572.1	580.5
Total Operating Expenses & Depreciation Charges	605.0	1476.0	1590.1	1798.2	2219.0	2579.0	3156.0	3178.3	3133.4

Source: Statistics Canada: Farm Net Income, Cat. No. 21-202

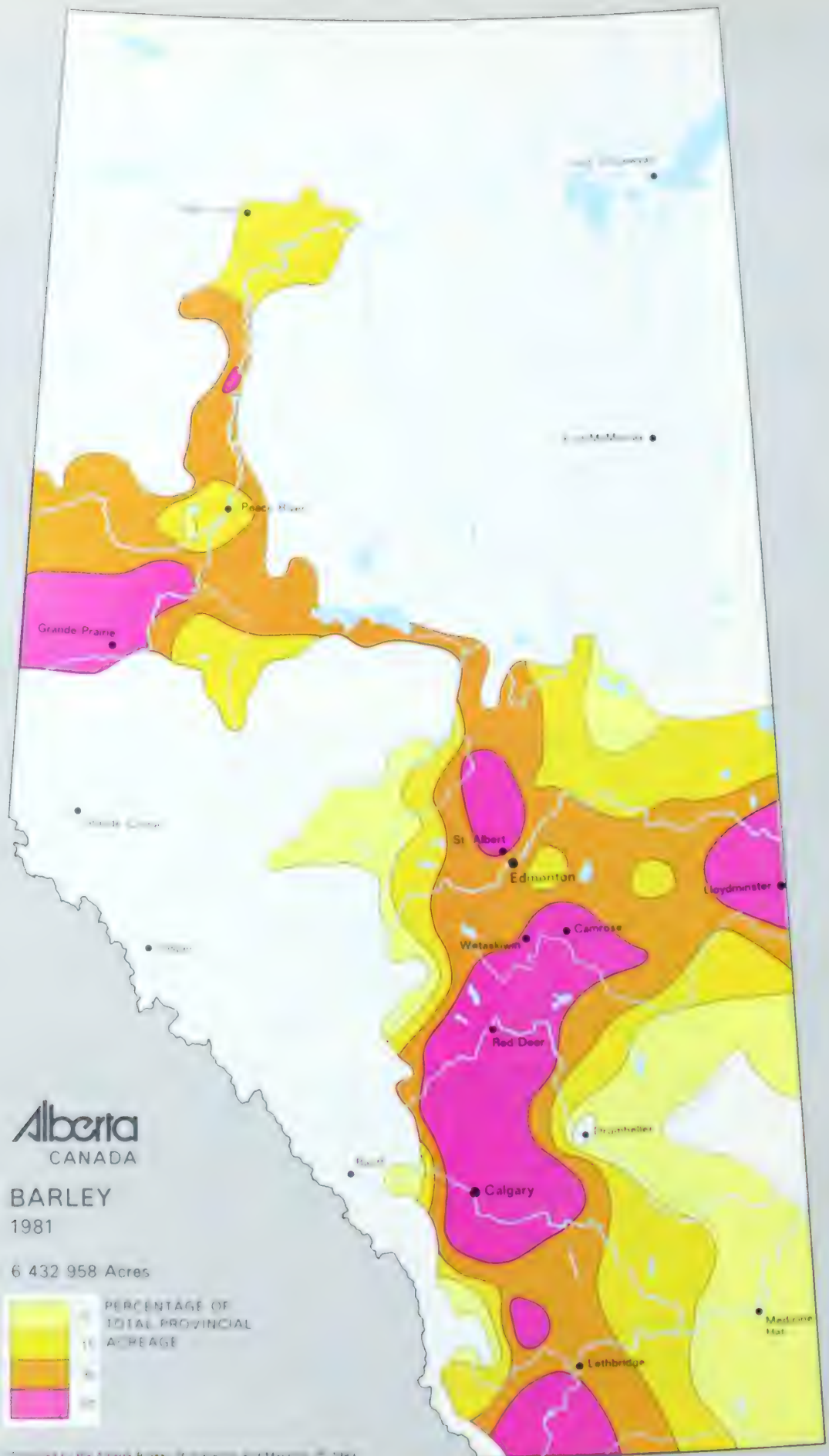
TABLE 2.14

**FARM MACHINERY
AND EQUIPMENT,
BY TYPE, BY
CENSUS DIVISION -
ALBERTA - 1981
(NUMBER)**

	CD 1	CD 2	CD 3	CD 4	CD 5	CD 6	CD 7	CD 8
Automobiles	1,921	4,769	2,269	1,542	3,621	5,191	4,212	5,998
Motor Trucks	4,909	11,471	5,378	4,334	9,151	9,067	9,129	11,078
Tractors	4,059	9,618	4,318	4,004	7,308	8,573	8,849	11,808
Grain Combines	1,407	2,802	1,286	1,326	2,877	2,291	3,375	3,456
Swathers	1,821	3,627	1,951	1,840	4,010	3,220	3,885	3,759
Balers	1,032	2,326	1,372	1,139	1,651	2,546	2,522	3,819
Forage Crop Harvesters	107	383	132	122	266	347	402	609
Other Machinery and Equipment (Value - million \$)	49.5	139.3	39.0	31.7	75.0	66.8	76.8	91.0

	CD 9	CD 10	CD 11	CD 12	CD 13	CD 14	CD 15	Alberta Total
Automobiles	71	7,237	8,243	2,809	5,386	780	7,901	61,950
Motor Trucks	112	14,602	12,342	5,310	9,505	1,154	16,293	123,835
Tractors	124	15,522	14,287	6,370	11,547	1,620	16,207	124,214
Grain Combines	4	6,341	4,178	2,265	3,823	301	6,931	42,663
Swathers	21	6,398	4,436	2,348	3,738	306	6,241	47,601
Balers	46	4,647	4,665	2,349	3,958	616	3,182	35,870
Forage Crop Harvesters	3	487	623	233	340	68	318	4,440
Other Machinery and Equipment (Value - million \$)	0.6	113.0	101.2	37.8	75.3	8.0	137.3	1042.3

Source: Census of Canada - 1981



crop rotations; not only do they provide feed for livestock, they build up the soil.

The hog industry has changed over the years. Hog slaughterings increased from just over 600,000 in 1951 to just under 2 million in 1971; since then, production has dropped substantially. There are now only about 10,000 farmers raising hogs as compared with 41,000 in the early 1960's. The average annual farm production is 126 animals; 15 years ago the corresponding figure was 39. Some 76 per cent of all hogs produced come from 1,200 farms. Hog raising is complementary to grain growing as the animals can be used as an alternative marketing channel for surplus of overly cheap feed grains and wheat.

Sheep production is also becoming increasingly concentrated; fewer producers market the majority of sheep and lambs for slaughter.

Over the last 15 years, there have been substantial changes in the total amount of cash income Alberta farmers have received. Annual farm cash receipts have increased from approximately \$600 million in the early sixties to nearly \$4 billion. Income, as well as expenses, have fluctuated considerably. Receipts from crops have recently exceeded those from livestock, a reflection of higher marketings. Farm cash receipts represent

only one part of total farm income. In addition to cash returns from the sale of agricultural products, many farmers supplement their incomes from non-farm sources in the forms of wages, salaries and business and investment incomes. It is estimated that, during recent years, the non-farm income has exceeded \$400 million annually.

Farms and ranches are generally thought of as producers rather than consumers, yet each year they spend in excess of \$3 billion on goods and services to maintain agricultural production. Total expenses have more than tripled over the past 10 years.

Alberta producers pay over \$3 billion annually for physical inputs into crop and livestock production. Expenses average over \$50 million on property taxes, \$160 million on farm rent, \$65 million for electricity and telephones and \$190 million for farm labour. Machinery expenses, including fuel, are the largest farm cash expenditure, totalling over \$550 million. Alberta farmers annual use of gasoline exceeds 475 million litres, and of diesel fuel 425 million litres.

Agriculture is a dynamic industry and is expected to remain so. A willingness to innovate and a commitment to reinvestment continues to enhance one of Alberta's strongest industries.



*Town of Athabasca
located on the
Athabasca River*

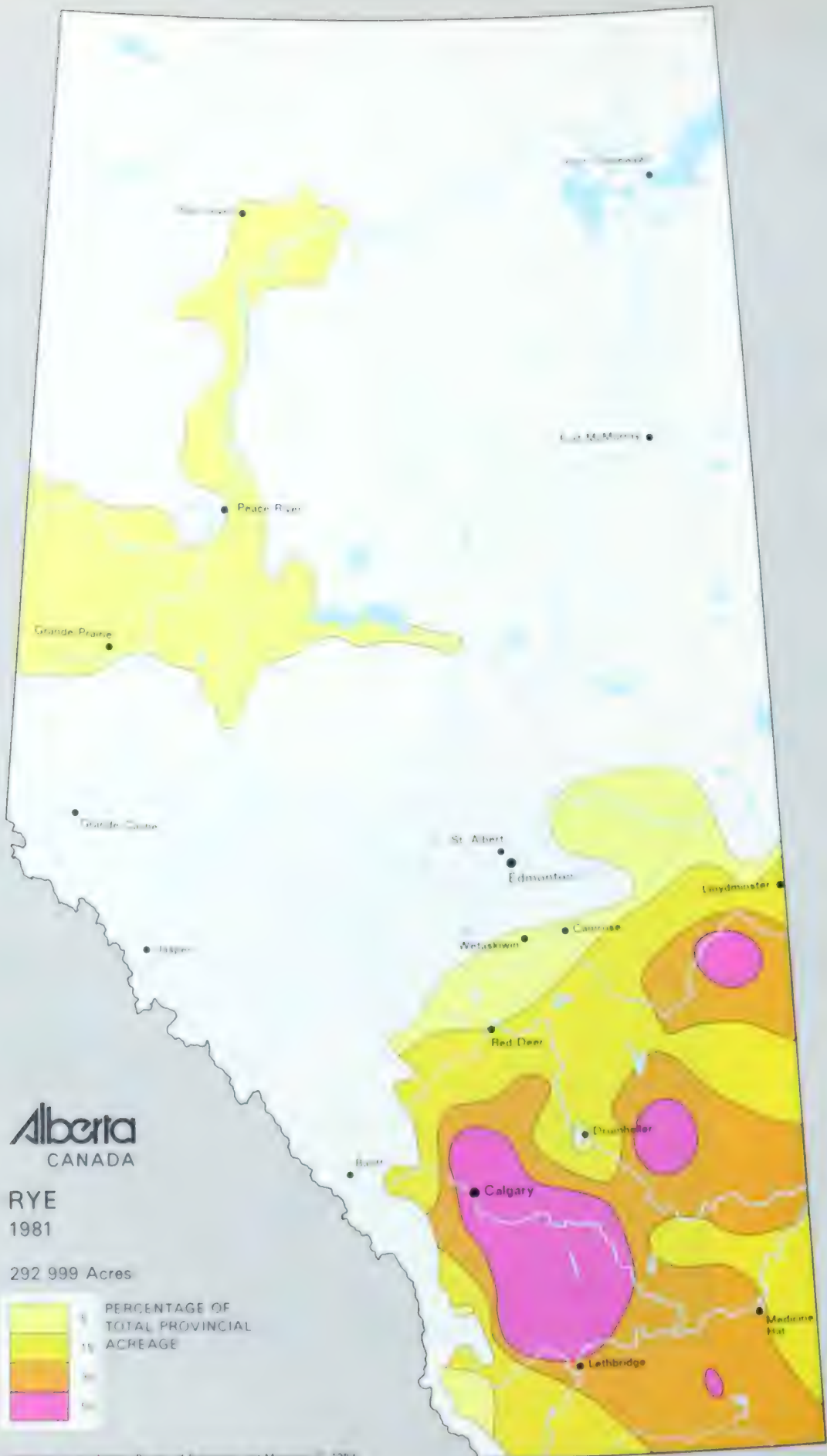


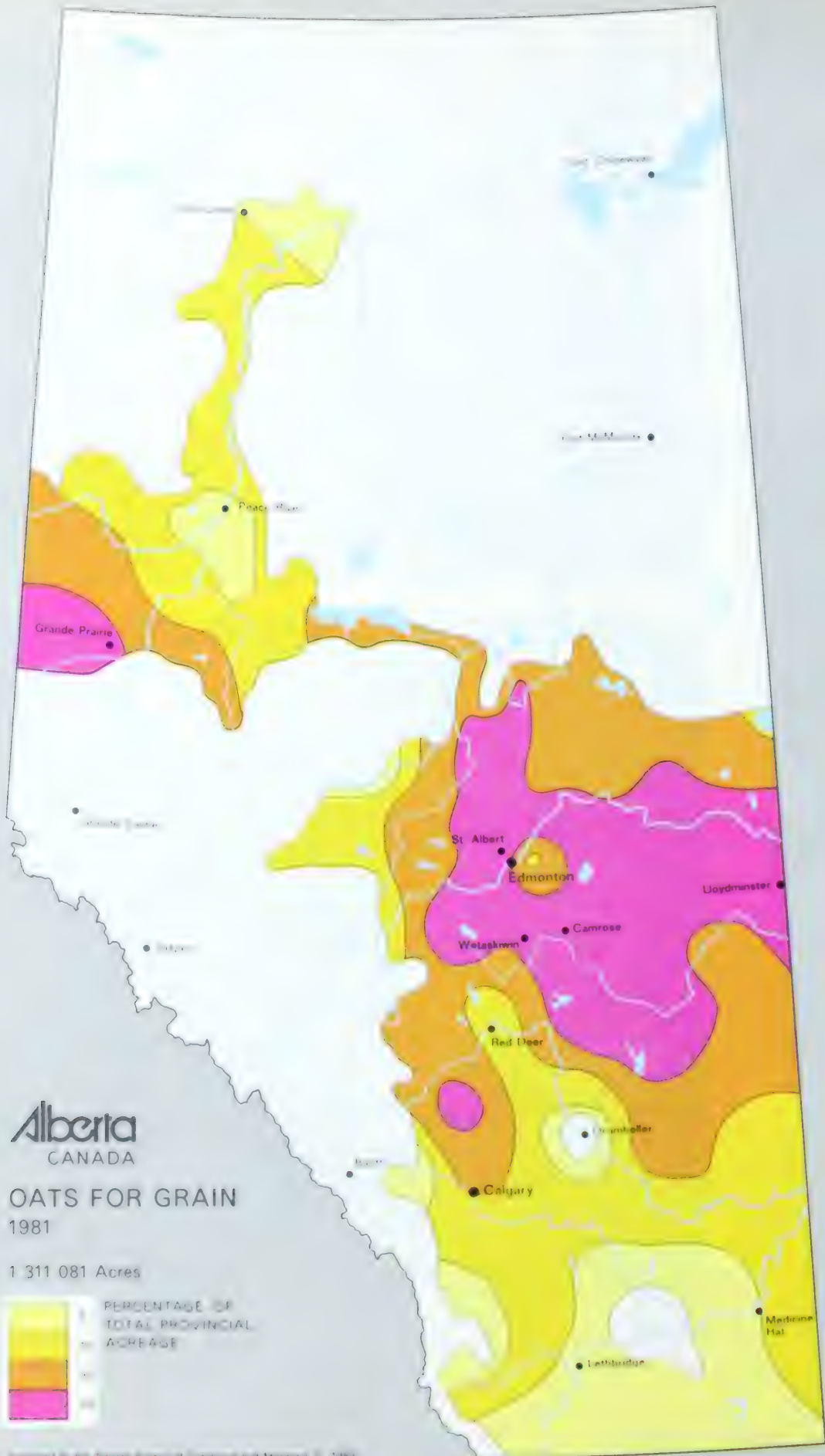
TABLE 2.15

**CENSUS FARMS BY
NUMBER, AREA,
TYPE OF
OPERATOR AND BY
GROSS VALUE OF
PRODUCTS SOLD,
BY CENSUS
DIVISION -
ALBERTA - 1981**

	Alberta	CD 1	CD 2	CD 3	CD 4	CD 5	CD 6	CD 7
Number of Farms	58,056	1 811	3 820	2 029	1 588	3 185	4 312	3 858
Hectares'000	19,109	1,495	1,535	1,037	1 944	1 489	1,130	1 799
Average Farm Size, Hectares	329	826	402	511	1,225	468	262	466
Number of Farms Operated, Classified by Form of Tenure of Operator								
Owners	33,850	876	2,208	1,078	307	1,443	2,577	1,812
Tenants	3,675	148	336	190	128	337	371	308
Part Owner, Part Tenant	20,531	787	1,276	761	1,153	1,405	1,364	1,738
Farms Reporting 1980 Sales of:								
\$250,000 and Over	1,697	73	339	151	42	164	222	132
\$100,000-\$249,999	5,630	285	716	299	258	583	500	587
\$50,000-\$99,999	9,873	519	995	376	459	946	702	981
\$25,000-\$49,999	11,049	441	721	389	402	682	705	858
\$10,000-\$24,999	12,003	280	528	371	255	476	752	685
\$5,000-\$9,999	6,387	102	213	157	92	150	470	271
\$2,500-\$4,999	4,525	56	141	107	42	84	359	164
Under \$2,500	6,892	55	167	179	38	100	602	180

	CD 8	CD 9	CD 10	CD 11	CD 12	CD 13	CD 14	CD 15
Number of Farms	5,606	68	7,124	7,018	3,138	5,442	818	8,239
Hectares'000	1,103	63	1,906	1,083	774	1,121	158	2,472
Average Farm Size, Hectares	197	919	268	154	246	206	193	300
Number of Farms Operated, Classified By Form of Tenure of Operator								
Owners	3,500	36	3,897	4,455	2,068	3,641	572	5,380
Tenants	335	5	464	391	121	170	26	345
Part Owner, Part Tenant	1,771	27	2,763	2,172	949	1,631	220	2,514
Farms Reporting 1980 Sales of:								
\$250,000 and Over	185	4	135	124	20	57	5	44
\$100,000-\$249,999	598	9	636	432	118	259	14	336
\$50,000-\$99,999	938	4	1,190	819	297	587	43	1,017
\$25,000-\$49,999	1,040	13	1,555	1,095	514	993	86	1,555
\$10,000-\$24,999	1,175	10	1,709	1,506	774	1,315	140	2 027
\$5,000-\$9,999	642	9	795	960	476	766	134	1,150
\$2,500-\$4,999	448	7	485	801	349	548	111	823
Under \$2,500	580	12	619	1,281	590	917	285	1,287

Source: Census of Canada - 1981



Produced by the Alberta Government in cooperation with Mapping & Survey

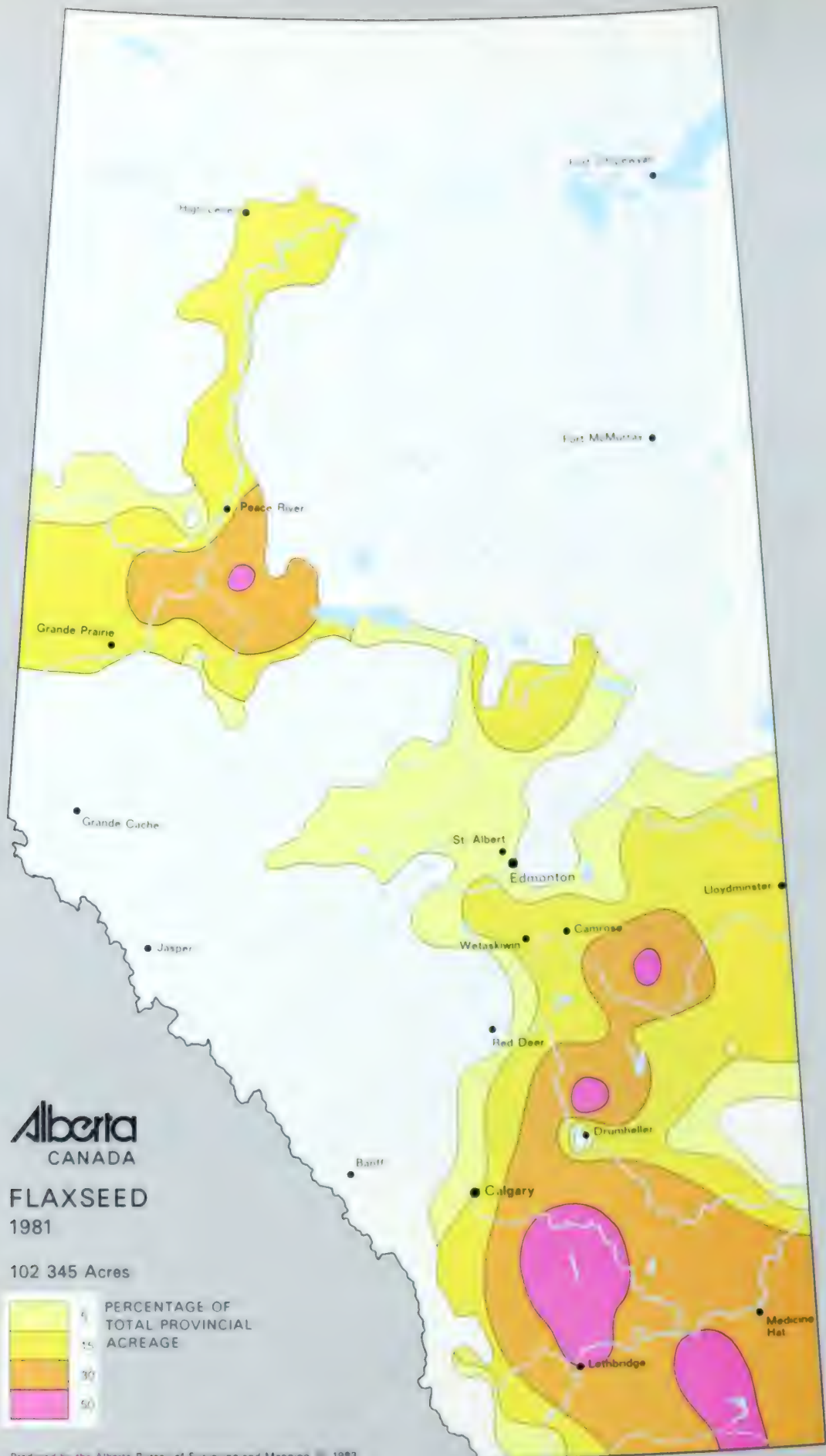
TABLE 2.16

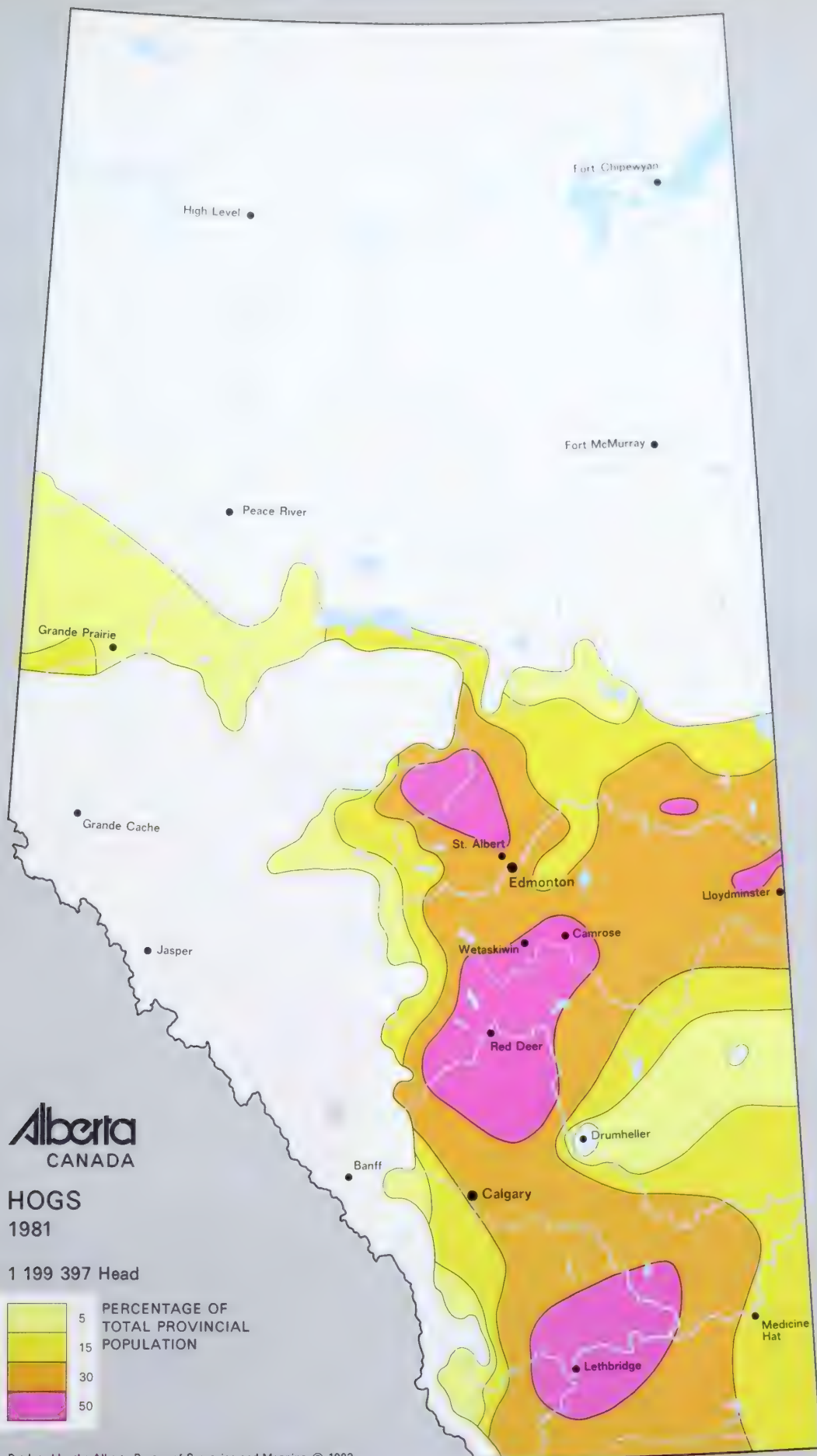
CENSUS FARMS
WITH SALES OVER
\$2,500 BY MAJOR
PRODUCT, BY
CENSUS DIVISION -
ALBERTA - 1980

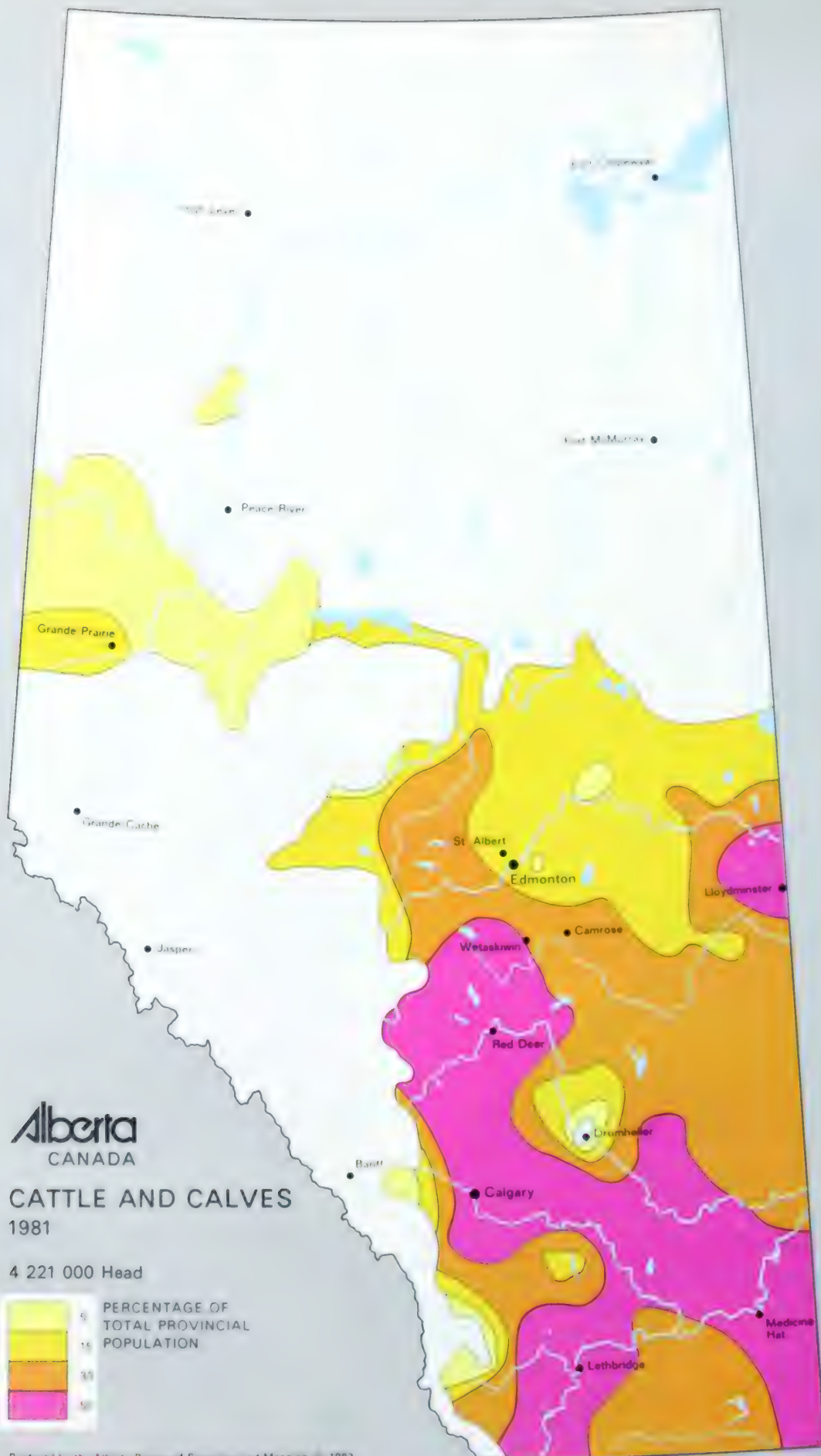
	Alberta	CD 1	CD 2	CD 3	CD 4	CD 5	CD 6	CD 7
Farms with Sales \$2,500 or More	51,164	1 756	3 653	1 850	1 550	3 085	3 710	3 678
Major Product Type:								
Dairy	2,743	47	165	71	33	62	219	88
Cattle	16,098	491	1,036	860	546	454	1,617	1 278
Hogs	1,402	17	124	41	7	78	95	60
Poultry	622	8	44	21	4	50	49	20
Wheat	7,378	821	939	231	707	1,223	164	703
Small Grains	16,493	172	581	432	162	1,008	1,060	1 191
Other Field Crops	1,122	50	367	23	3	16	91	16
Fruits & Vegetables	76	4	28	-	-	1	4	-
Miscellaneous Specialty	1,574	55	92	66	13	38	229	38
Mixed Farms	3,656	91	277	105	75	155	192	284
Livestock	2,515	42	109	60	31	103	125	187
Field Crops	112	6	91	1	-	-	-	2
Other Combination	1,029	43	77	44	44	52	67	95

	CD 8	CD 9	CD 10	CD 11	CD 12	CD 13	CD 14	CD 15
Farms with Sales \$2,500 or More	5,026	56	6,505	5,737	2,548	4,525	533	6,952
Major Product Type:								
Dairy	460	1	330	676	122	286	42	141
Cattle	2,525	37	1,210	2,008	940	1,826	313	957
Hogs	206	1	151	213	110	215	9	85
Poultry	28	-	103	140	29	55	15	56
Wheat	57	-	1,144	211	133	132	15	898
Small Grains	1,228	3	2,735	1,578	782	1,358	51	4,152
Other Field Crops	77	3	29	160	39	66	27	155
Fruits & Vegetables	4	-	1	14	2	4	3	11
Miscellaneous Specialty	184	8	82	349	71	133	30	186
Mixed Farms	257	3	720	388	320	450	28	311
Livestock	172	2	583	284	260	366	26	165
Field Crops	-	-	1	2	-	2	-	7
Other Combination	85	1	136	102	60	82	2	139

Source: Statistics Canada, 1981.







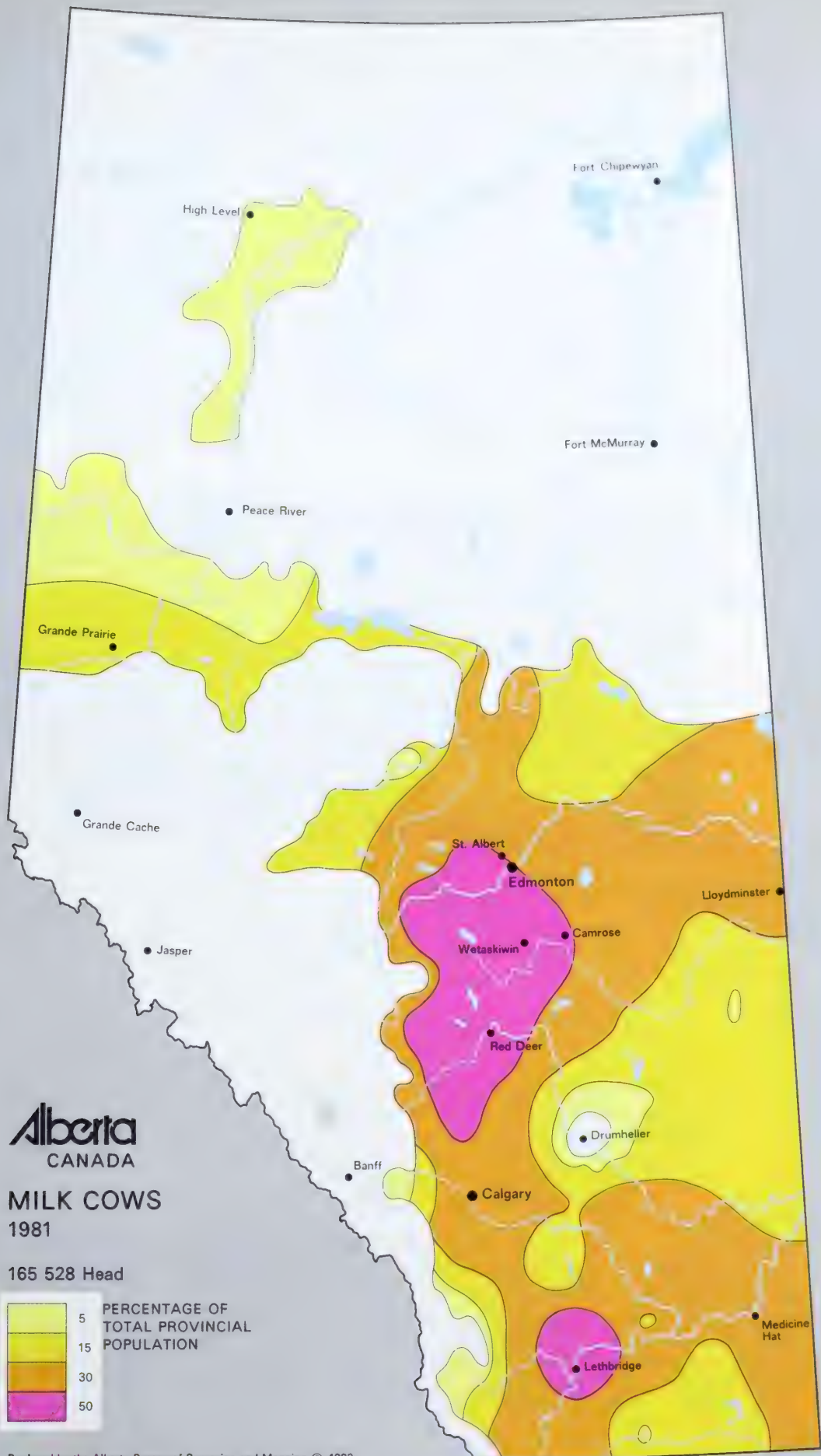


TABLE 2.17

ANIMAL
SLAUGHTERINGS
IN FEDERALLY
INSPECTED
ESTABLISHMENTS -
ALBERTA
-1959-1983
(NUMBER)

Year	Sheep &				Year	Sheep &			
	Cattle	Calves	Hogs	Lambs		Cattle	Calves	Hogs	Lambs
1959	176 486	65 420	1 684 782	84 311	1971	1 015 967	17 679	1 972 024	45 199
1960	440 431	76 622	1 334 369	75 106	1972	1 112 338	15 072	1 864 356	52 885
1961	534 173	68 812	1 246 451	88 852	1973	1 112 300	12 641	1 761 077	67 754
1962	562 166	71 140	1 351 535	95 132	1974	1 131 523	27 964	1 596 518	51 004
1963	606 293	53 143	1 138 419	104 209	1975	1 352 116	59 692	1 231 721	70 627
1964	686 084	67 293	1 381 411	105 812	1976	1 537 610	45 539	1 088 949	75 996
1965	746 674	86 611	1 429 677	79 523	1977	1 590 184	40 855	1 156 998	45 254
1966	813 669	70 275	1 196 402	66 081	1978	1 381 304	18 670	1 162 697	32 413
1967	846 419	67 312	1 407 583	60 868	1979	1 256 614	4 262	1 415 571	32 963
1968	899 931	63 656	1 541 046	50 854	1980	1 251 181	4 181	1 738 061	38 530
1969	860 475	31 562	1 268 145	40 911	1981	1 294 827	8 009	1 686 835	56 849
1970	895 320	18 917	1 515 573	36 331	1982	1 320 551	6 786	1 568 539	77 748
					1983	1 308 027	4 869	1 599 267	93 602

TABLE 2.18

LIVESTOCK AND
POULTRY ON
CENSUS FARMS, BY
CENSUS DIVISION -
ALBERTA -1981
(NUMBERS IN
THOUSANDS)

	Census Divisions															
	Alberta	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cattle	4,193	192	453	309	247	288	405	354	492	13	366	339	178	330	48	179
Pigs	1,229	26	154	60	18	108	62	73	196	30	139	116	67	129	11	47
Sheep	181	4	30	47	1	7		3	22		12	15	4	17	3	16
Horses	120	3	5	6	5	5	15	8	15	2	10	15	7	9	2	13
Goats	10	0	0		0	0	1	0	2		1	2	1	2	0	1
Rabbits	24	0	9		0	0	1	1	2		1	4	1	3	0	2
Chickens	9,192	194	1198	469	84	1051	1188	327	260	1	1140	1945	228	737	35	335
Turkeys	748	15	77		1	176		6	5		80	219	14	146	1	8
Geese	69	5	9	7	2	6	3	5	5	0	7	7	3	5	1	11
Ducks	123	9	16	19	5	16		7	7		15	18	3	4	0	4

Source: Census of Canada, 1982

Minerals

Alberta is richly endowed with mineral resources and leads all the provinces in value of mineral production. Most valuable are the fossil fuels (discussed in the Energy Resources section), but the province has plenty of other minerals of the non-fuel variety. These are mainly the industrial, or nonmetallic minerals — the basic building blocks of industry. Metallic minerals have little importance in Alberta; few deposits exist and no production has taken place.

The industrial minerals exist in variety and in quantity, forming a broad raw material base for Alberta industry. The value of production in 1983 was \$72.2 million, third highest among the provinces, and about 20 per cent of the national total for industrial minerals. Nearly two thirds of the Alberta

production is accounted for by sulphur, one of few minerals valued highly enough for export marketing. Most industrial minerals, owing to their high bulk, low value nature, do not have long distance marketing potential. Thus, except for sulphur, most of the production is consumed within the province.

Alberta's industrial minerals fall into two main use groups: those for construction materials and those for chemical industries. The metallic minerals, though unused as yet, have some potential for future commercial development.

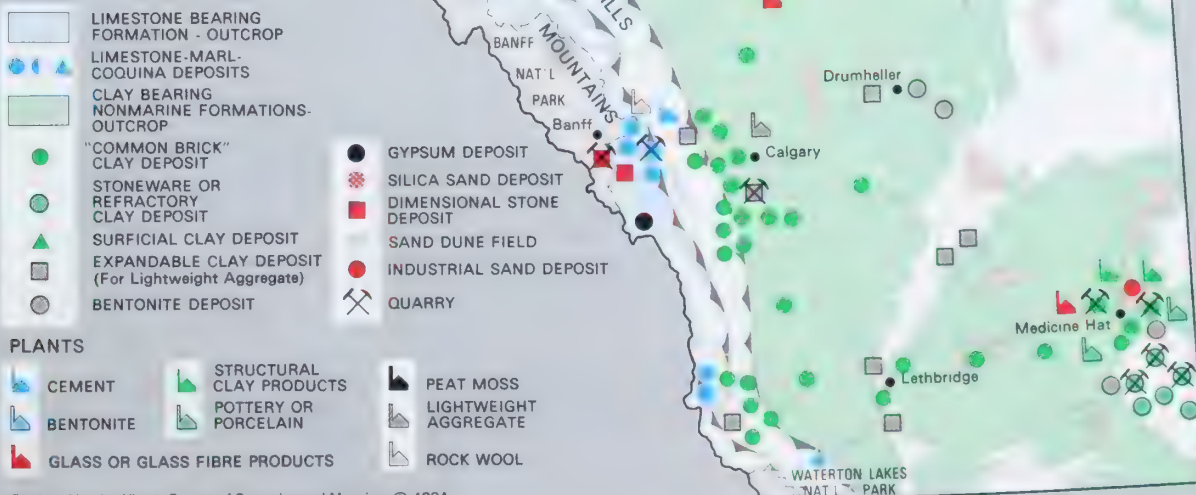
MINERALS FOR CONSTRUCTION MATERIALS INDUSTRIES

Minerals of this group include the materials of cement, ceramics, and building products manufacture, and the mineral materials (natural or

Alberta
CANADA

1982

MINERALS FOR CONSTRUCTION MATERIALS INDUSTRIES



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manufactured) used for aggregates. These are sufficiently developed to supply local needs, with some exports of construction materials outside the province.

CEMENT

One of the most versatile and widely used of all construction materials, portland cement is manufactured from three essential mineral raw materials — limestone, clay, and gypsum.

The Alberta cement industry currently has two operating plants, which have recently undergone major expansions to bring the total annual production capacity to 2.6 million tonnes. Production in 1983 was 1.3 million tonnes valued at \$138.6 million. The principal raw material for cement making is limestone, about 1.4 tonnes being required per tonne of cement. This is supplied from rock quarries in the mountains. Clays are widely available and are obtained from nearby the cement plant sites. However, the gypsum requirements must be imported, mainly from British Columbia.

LIMESTONE

Huge reserves of limestone are found in rock formations exposed along many of the ranges of the Rocky Mountains. These limestone formations underlie the Plains as well, but are generally too deep for exploitation except in the northeast region. Shallow, flat lying beds of limestone are exposed in the vicinity of Fort McMurray.

The best limestone deposits are found on the easternmost ranges of the Rocky Mountains. Development potential exists where the deposits lie adjacent to railway lines, and quarries are operated at four such localities. The two largest, at Cadomin and Exshaw, each currently produce 900,000 tonnes of limestone annually for cement making. From Cadomin the limestone is hauled to a cement plant at Edmonton, a rail distance of 290 kilometres. At Exshaw, the cement plant is situated on the quarry site. Other quarries in the mountains produce limestone mainly for lime manufacture.

A material that can substitute for limestone in cement making is marl, also widely found in Alberta. However, most deposits are small. One deposit near Clyde, 65 kilometres north of Edmonton, was for a time worked for use in a small-scale cement plant.

CLAYS AND SHALES

Clays, and their indurated rock equivalent, shales, are very widespread in Alberta. They are found throughout the Plains in virtually all the bedrock formations and in many of the surficial deposits, and extensively in the mountain region as well. The clays are mostly the low grade, low-alumina variety, suitable only for cement or low-value ceramic use. In cement making, no special grade of clay is needed and manufacturers normally can use whatever lies handiest to the plant.

For ceramics, the best clays are found in the non-marine bedrock formations. They are primarily the "common brick" type, but some intermediate grades such as stoneware clay and fireclay are known in a few localities. These are useful for higher value ware such as sewer pipe, flue liners, facing brick, pottery and stoneware crocks, and for low heat-duty refractories. High grade clays of the type required for whiteware are not found in the province.

The better grades of clay are found mostly in the Cypress Hills area of southeastern Alberta. These are used for structural clay wares in plants at Medicine Hat and Redcliff, and also are blended with imported clays for use in pottery plants in the area. Many of the clays found in this area are of stoneware grade. Other stoneware clays are known in widely scattered deposits in Alberta, notably in the Fort McMurray area underlying the Athabasca Oil Sands. Fireclay is found in association with coal measures in at least one locality — at Wabamun, 60 kilometres west of Edmonton. Surficial clays, despite certain quality deficiencies, have had widespread use for brick making in the past, mainly because they were handiest. Currently, a brick plant in Edmonton uses glacial lake clays, quarried at the plant site and also near the town of Athabasca, 130 kilometres north.

The value of ceramic clay products produced in Alberta in 1983 was \$12.6 million. Most structural wares are used within the province in the construction industry. Other products are marketed widely in western Canada. Alberta clays and shales also are used for manufacturing lightweight aggregate (see Construction Aggregates), and mineral wool fibre. A dolomitic shale is quarried in the mountains near Exshaw as raw material for a rock wool insulation plant. Production values are not reported for these products.



GYPSUM

Alberta's annual consumption of gypsum currently totals about 325,000 tonnes valued at \$2.4 million. About 260,000 tonnes are used for gypsum wallboard manufacture at three plants in the province, the remainder for cement manufacture at two cement plants. All the gypsum is imported, mostly from British Columbia. Several gypsum deposits known to exist in Alberta are undeveloped, owing to remote or restricted locations or difficult accessibility.

The deposits with best development potential are found in northeastern Alberta. One of these, at Peace Point on the Peace River, lies within Wood Buffalo National Park, but on lands claimed by the Indians. Should these lands eventually convert to Indian Reserve, the deposit — which is of very high grade and extent — could be opened to development. Another deposit, underlying the Athabasca River valley downstream from Fort McMurray, is better located but of lower grade. Development of either deposit will have to await the industrialization expected for this region with further oil sands development.

SILICA SAND

Consumption of silica sand in Alberta amounts annually to about 100,000 tonnes for glass and glass fibre manufacture and another 100,000 tonnes for hydraulic fracturing, sand blasting, foundries, and a host of minor uses. These silica sand requirements are met by processing and upgrading local dune sands and by imports into the province. Production of local sand was valued at \$2.9 million in 1983.

Most of the required high quality silica sand is imported. A few sources of good quality sand exist in Alberta but are remote from markets and are undeveloped. The best prospective deposits are found along the Peace River in northwestern Alberta, along the Clearwater River in northeastern Alberta, and in the tailings of Athabasca Oil Sands extraction plants.

DIMENSION STONE

Stone marketed in specified shapes and sizes for building and ornamental purposes includes many types, the most common being granite, sandstone, limestone, and marble. Currently the only

dimension stone produced in Alberta is sandstone — a very fine grained flaggy type — from quarries near Canmore in the Rocky Mountains. Production volume is small.

CONSTRUCTION AGGREGATES

Basic materials of construction aggregates constitute by far the largest tonnage volume of industrial mineral production in Alberta. Although the lowest priced per unit weight, they are exceeded in value of production only by sulphur and cement. Being heavy, bulky, low priced materials, aggregates cannot be marketed beyond distances of a few kilometres. Consequently, numerous aggregate producing sites are scattered across the province to serve local construction requirements. Sand and gravel comprise the bulk of aggregate production and use. Manufactured lightweight aggregates have specialized application mainly in large urban construction projects. Crushed stone aggregate is not produced in the province.

Alberta has rich resources of sand and gravel, which are developed to the extent of the province's needs. Production in 1983 was 42.5 million tonnes valued at \$116 million. Road building accounts for about two-thirds of the material used, with the balance going for use in concrete and asphalt mixes, dam construction, railway ballast, and a number of minor uses. The sands and gravels are found in a variety of geologic types of deposits, distributed widely throughout the province though not everywhere in accordance with local need. Haulage distance will be an increasingly critical factor in future developments.

Lightweight aggregate production is mostly expanded clays and shales made from local materials. Some imported vermiculite and perlite also is made into expanded aggregates for specialized application in lightweight plaster and insulating concrete. Expandable clays and shales are extensive in Alberta, though many are located too far from urban markets to warrant development. Two plants in the Edmonton area produce expanded aggregate from the surface clay deposits on the plant sites. Another in Calgary uses shale quarried a few kilometres south of the city. Total production from these plants is not reported.



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TABLE 2.19

PRINCIPAL
STATISTICS OF THE
MINING INDUSTRY
- ALBERTA -
1965-1981

	Establish- ments No.	Employees	Salaries & Wages (\$ 000)	Cost of Fuel & Electricity (\$ 000)	Cost of Materials & Supplies (\$ 000)	Value of Production (\$ 000)	Value Added (\$ 000)
1965	295	11 553	80 228	10 094	22 088	722 706	690 524
1966	278	11 954	89 913	8 378	25 104	808 627	775 145
1967	285	12 745	105 615	8 747	27 996	935 052	898 310
1968	293	13 568	119 828	10 087	21 748	1 061 678	1 019 853
1969	324	14 182	135 627	12 200	33 627	1 154 431	1 108 604
1970	324	15 569	155 438	15 865	49 007	1 324 474	1 259 603
1971	339	16 718	180 601	18 735	53 645	1 552 148	1 479 769
1972	379	17 229	200 735	22 600	59 813	1 870 250	1 787 838
1973	390	17 109	213 756	27 895	65 843	2 631 734	2 537 996
1974	290	18 614	261 164	34 429	91 651	4 326 859	4 200 779
1975	279	18 988	292 158	37 374	118 100	5 501 665	5 346 191
1976	266	20 290	361 412	54 699	189 553	6 532 169	6 287 917
1977	271	21 533	415 373	59 619	216 948	8 062 203	7 785 636
1978	255	23 404	483 070	73 051	202 872	9 303 625	9 027 701
1979	265	25 507	570 154	83 234	257 023	11 608 881	11 268 624
1980	334	28 429	703 632	102 115	334 530	13 935 960	13 499 315
1981	375	29 399	811 623	124 635	461 484	15 148 050	14 561 930

No. 26/201

The main application of expanded clay aggregate is in concrete blocks, where the reduced weight results in lower handling and transportation costs. Its use, also, in poured-in-place concrete has increased significantly, particularly in high-rise structures, where the reduced dead load reduces the need for structural steel and allows for greater design flexibility. Additional advantages come from better thermal and acoustical insulation and fire resistance.

OTHER MINERALS: BENTONITE AND PEAT MOSS

These are minerals of miscellaneous uses, not strictly for construction materials, but related to that category.

Bentonite is very common in Alberta but pure deposits are rare. Only one deposit is currently worked in the province, near Rosalind along the Battle River, 110 kilometres southeast of Edmonton. The total production of about 12,000 tonnes per year is used mainly in foundries and for lining dams and ponds.

Peat moss bogs are widespread throughout the northern two-thirds of the province. Peat moss is commercially harvested in four localities, the largest production coming from a plant near Evansburg, 80 kilometres west of Edmonton. Total production in 1983 was 44,000 tonnes valued at \$6.8 million. Much of the production is exported, mainly for horticultural use.

MINERALS FOR CHEMICAL INDUSTRIES

Alberta minerals (other than hydrocarbons) that serve as basic raw materials for the chemical industries include salt, sodium sulphate, sulphur, and limestone. The end users are the wood pulp, fertilizer, and lime industries, in which the end products commonly bear little similarity to the basic minerals as a result of chemical reforming. The products have much higher unit values, even to the extent that some are commodities of world trade.

SALT

The wood pulp industry in Alberta and western Canada provides a major market for the province's output of salt. This salt is not used directly as such, but rather in the form of chloralkali chemicals, including chlorine, sodium hydroxide, and sodium chlorate. However, part of Alberta's salt production is used directly, for purposes ranging from household consumption to ice control on roads.

Alberta's salt deposits are of vast extent, underlying almost half the province in beds 60 metres or more in thickness. Currently, there are two salt plants operating: one at Fort Saskatchewan, a few kilometres northeast of Edmonton, where salt is brined from beds 1,900 metres deep for chloralkali chemicals manufacture; and one at

VALUES OF PRODUCTION



1951



1961



1971



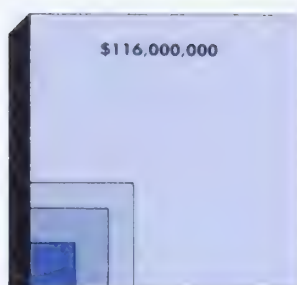
1983



NIL



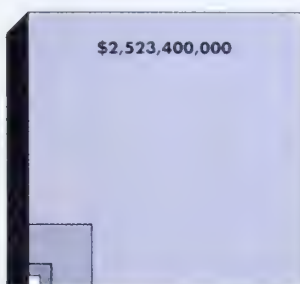
LIME



SAND AND GRAVEL



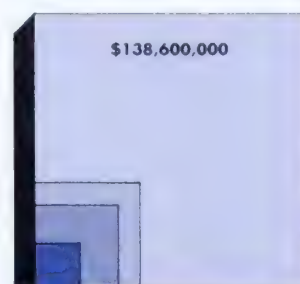
STONE



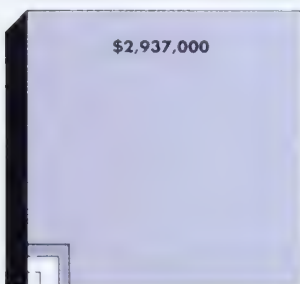
**NATURAL GAS
BY-PRODUCTS**



CLAY PRODUCTS



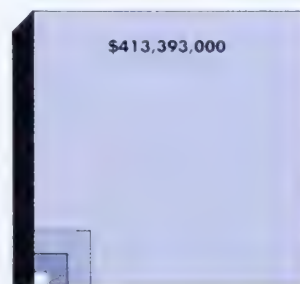
CEMENT



QUARTZ



SODIUM SULPHATE



SULPHUR



CRUDE OIL



COAL



NATURAL GAS



PEAT MOSS

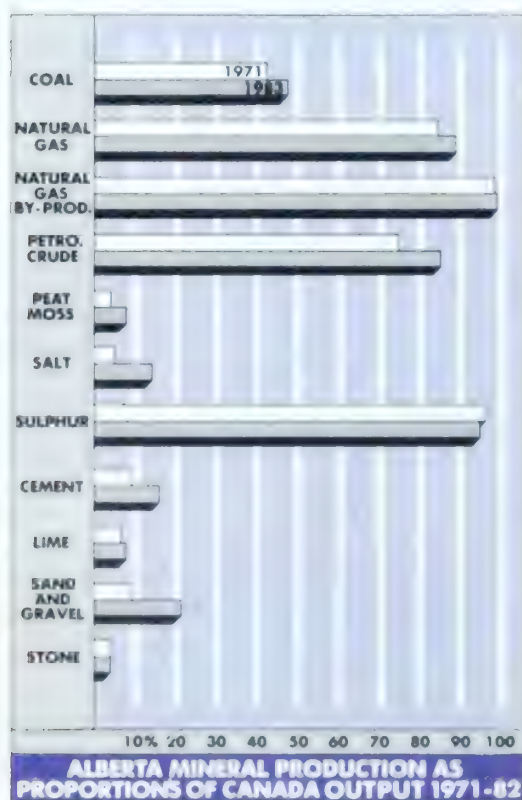


SALT

Lindberg about 190 kilometres east of Edmonton, where salt for domestic and industrial use is brined from beds 1,100 metres deep. In addition, the salt beds are utilized indirectly at three localities for underground storage of petroleum products, in artificially created caverns. The 1983 salt production was 1.2 million tonnes valued at \$15 million. Approximately 85 per cent of this production was for chemical use.

SODIUM SULPHATE

Alberta produces 60,000 tonnes per year of sodium sulphate, about 10 per cent of Canada's output. Production is from a single plant at Metisko Lake about 210 kilometres east of Red Deer. In 1983 the production was valued at \$3.9 million. Alberta's sodium sulphate is a high purity product used mainly in detergents, though the bulk of Canadian production has its chief use in pulp processing. Other minor uses are in the manufacture of glass, sodium chemicals, pharmaceuticals, fertilizers, and in dyeing, tanning and uranium processing. Reserves in the Metisko Lake deposit are estimated in the order of 3 million tonnes. Several other known deposits in Alberta are too small for economic development at present.



SULPHUR

Alberta is a major world producer and exporter of sulphur, having the world's largest production from hydrocarbon sources. Most of it comes as a co-product of natural gas processing, collected in sulphur extraction plants scattered throughout the province. A small percentage is recovered from synthetic crude oil extracted from the Athabasca Oil Sands. In 1983 Alberta sulphur production totalled 6 million tonnes, with sales valued at \$413 million. Less than 15 per cent of Alberta sulphur sales are to Canadian industries; the rest is exported.

The wood pulp processing and fertilizer industries are the principal domestic consumers of sulphur. The former utilizes sulphur for the manufacture of bleaching liquor in the kraft process, and for bleaching and cooking liquors in the sulfide process. Its use in the fertilizer industry is for leaching (by sulphuric acid) of phosphate rock for the manufacture of phosphates, and also as a component in the manufacture of some fertilizers (for example, ammonium sulphate). Western Canada's fertilizer industry is based largely in Alberta because of the combination of availability of low-cost sulphur and of natural gas. Much of the production is exported for the large agricultural market in the western United States. Among many lesser applications, sulphur is used in the manufacture of chemicals, rubber products, explosives, plastic and synthetic resins, and in petroleum refining and uranium ore processing.

Sulphur extraction plants are scattered throughout southwest and west-central Alberta wherever sour natural gas is produced. Although the hydrogen sulphide content of sour gas fields ranges as high as 91 per cent, most producing fields contain from one to twenty per cent. The percentages generally increase to the southwest with increasing formation depths and temperatures. Proved recoverable reserves in 1981 were about 130 million tonnes, with an additional 16 million tonnes stockpiled.

TABLE 2.20

**VOLUME AND
VALUE OF
MINERAL
PRODUCTION -
ALBERTA -
SPECIFIED YEARS
-1941-1983**

		1941	1951	1961	1971	1981	1983 ^{ff}
Fuels							
Coal	'000 Tonnes	6,323	6,948	1,840	7,269	18,446	21,400
	\$ 000	19,382	40,982	10,473	42,418	325,750	462,400
Natural Gas	'000 000 m ³	-	-	-	58,243	64,306	61,632
	\$ 000	5,175	3,494	53,830	290,672	5,993,990	6,227,597
Natural Gas By-Products	'000 m	-	-	-	13,056	18,526	17,097
	\$ 000	-	-	15,555	186,339	2,062,154	2,523,359
Petroleum, Crude	'000 m	1,576	7,296	25,078	59,035	64,274	64,464
	\$ 000	13,986	113,870	380,171	1,055,769	8,303,712	12,282,894
Structural Materials							
Clay Products	\$ 000	1	1,788	3,517	4,031	15,308	12,565
Cement	'000 Tonnes	78	262	615	770	1,445	1,260
	\$ 000	1,000	3,898	12,420	18,736	94,848	138,600
Lime	'000 Tonnes	16	28	44	91	183	159
	\$ 000	151	395	838	2,034	11,047	10,717
Sand and Gravel*	'000 Tonnes	867	3,891	11,423	16,946	26,465	42,500
	\$ 000	434	3,194	10,927	16,285	97,323	116,000
Stone	'000 Tonnes	7	12	88	167	271	125
	\$ 000	24	47	337	709	2,017	1,600
Non-Metallics							
Peat Moss	'000 Tonnes	-	-	-	10	45	44
	\$000	5	-	-	319	6,512	6,792
Quartz	\$ 000	-	-	-	72	3,173	2,937
Sodium Sulphate	\$ 000	-	-	-	1,242	3,030	3,936
Sulphur Elemental	'000 Tonnes	-	-	308	2,733	7,709	6,015
	\$ 000	-	-	6,133	19,589	626,140	413,393
Salt	'000 Tonnes	15	18	76	222	855	1,195
	\$ 000	261	473	1,355	2,292	13,638	15,071
Metals							
Gold	Grams	6,687	3,017	5,319	2,457	48	21
	\$ 000	8	4	6	3	847	352
Silver	Grams	653	280	529	-	-	-
	\$ 000	8	8	16	-	2	-
Total Value	\$ 000	41,364	168,144	495,563	1,640,508	17,559,491	22,218,213

^{ff} Preliminary

* Sand and gravel are not legally minerals in Alberta but are part of the surface in accordance with the Sand and Gravel Act 1951

Source: Statistics Canada: Canada's Mineral Production Cat. No. 26-202

LIME, LIMESTONE AND DOLOMITE

Lime produced in Alberta is the high-calcium type requiring high-purity limestone as the starting raw material. The limestone production for lime making is about 430,000 tonnes yearly, produced from quarries in the Crowsnest Pass and the Bow Valley. Large deposits of dolomite located near the limestones are not utilized, as dolomitic (or magnesian) lime is not currently produced in the province.

The 1983 production of Alberta lime was 159,000 tonnes valued at \$10.7 million. This production serves many markets both in the province and outside, the major users being the chemical and metallurgical industries. Pulverized limestone rock is also produced for direct use as a substitute in some lime applications.

TABLE 2.21

VOLUME OF
MINERAL
PRODUCTION* -
ALBERTA AND
CANADA - 1971
AND 1981-1983

		1971		1981		1982		1983	
Units		Alberta	Canada	Alberta	Canada	Alberta	Canada	Alberta	Canada
Fuels									
Coal	'000 Tonnes	7 269	16 721	18 446	40 088	20 000	42 811	21 400	44 250
Natural Gas	'000 000 m ³	58 243	70 407	64 306	73 824	66 912	75 977	61 632	69 266
Natural Gas By-Products	'000 m ³	13 056	13 607	18 526	18 883	18 098	18 466	17 097	17 408
Petroleum, Crude	'000 m ³	59 035	78 300	64 274	74 553	62 728	73 790	64 464	76 874
Non-Metallics									
Peat Moss	'000 Tonnes	10	343	45	462	47	487	44	544
Salt	'000 Tonnes	222	5 028	855	7 240	863	7 940	1 195	8 590
Sulphur, Elemental	'000 Tonnes	2,733	2 857	7,709	8,018	6,678	6 945	6 015	6 327
Structural Materials									
Cement	'000 Tonnes	770	8 234	1 445	10 145	1 518	8 426	1 260	7 828
Lime	'000 Tonnes	91	1 491	183	2 555	151	2 197	159	2 126
Sand & Gravel	'000 Tonnes	16 946	193 494	26 465	260 134	46 092	216 274	42 500	199 293
Stone	'000 Tonnes	167	66 692	271	85 091	264	59 181	125	62 359
Metals									
Gold	'000 g	2	64 091	48	52 034	11	64 735	21	70 746
Silver	'000 kg	-	1 305	-	1 129	-	1 314	-	1 106

*Only minerals produced in Alberta are compared with Canada totals.

Source: Statistics Canada, *Commodity Accounts*, *Mineral Production*, Vol. 2, 2001.

TABLE 2.22

PRODUCTION &
DISPOSITION OF
SULPHUR - ALBERTA
- 1971-1983

	Total Produced '000 Tonnes	Total Marketed '000 Tonnes	Gross Value of Sales \$ '000	Delivered To							
				Alberta		Other Provinces		United States		Offshore	
				'000 Tonnes	% of Total	'000 Tonnes	% of Total	'000 Tonnes	% of Total	'000 Tonnes	% of Total
1971	4,558	2,715	19 284	272	10.0	381	14.0	769	28.3	1 293	47.6
1972	6,652	3,155	17,738	284	9.0	382	12.1	749	23.7	1 740	55.2
1973	7 087	4 064	22,841	298	7.3	362	8.9	804	19.8	2 600	64.0
1974	6 858	4 977	67,492	350	7.0	412	8.3	1 107	22.2	3 108	62.5
1975	6,475	3,835	86,153	300	9.9	321	8.4	862	22.5	2 272	59.2
1976	6,342	3 964	69 291	302	7.6	306	7.7	926	23.4	2 430	61.3
1977	6 413	5 137	79 256	355	6.9	337	6.6	1 101	21.4	3 344	65.1
1978	6 331	5,650	99 587	408	7.2	385	6.8	1 111	19.7	3 746	66.3
1979	6 160	6,147	155,255	452	7.4	397	6.5	1 175	19.1	4 123	67.0
1980	6,027	7 489	433,616	485	6.5	364	4.9	1 461	19.5	5 179	69.2
1981	5,662	7 709	626,140	474	6.1	368	4.8	1 532	19.9	5 335	69.2
1982	5 299	6,570	551 424	334	5.1	317	4.8	1 166	17.7	4 753	72.4
1983	5,479	6 228	413 393	415	6.7	295	4.7	1 099	17.6	4 419	71.0

Source: Statistics Canada, *Commodity Accounts*, *Mineral Production*, Vol. 2, 2001.

METALLIC MINERALS

Few metallic mineral deposits are known in Alberta. The only production has been small amounts of placer gold, recovered from river gravels and as a by-product of gravel screening and washing operations (in pre-glacial deposits). Production in 1983 was reported as 21,000 grams valued at \$352,000.

Potential for major metallic minerals production exists mainly in the Canadian Precambrian Shield in northeastern Alberta, and in the iron ore deposits of the Clear Hills area in northwestern Alberta. The Precambrian Shield provides a favourable geological setting for metallic mineralization. Uranium showings have been found in the area adjacent to Lake Athabasca, and uranium exploration on the Shield is currently active. The Clear Hills iron deposits, with 180 million tonnes of proven strippable ore, constitute the largest potential source of iron ore in the four western provinces. Their development is still awaiting an economically viable beneficiating and smelting process. The low grade (35 per cent Fe) and complex metallurgy of the ore have barred development to date.

Magnesium-rich brines exist in several of Alberta's subsurface reservoir formations. These brines have magnesium concentrations eight to ten times that of seawater, the source of most of North America's magnesium metal, and may have economic potential for magnesium metal extraction by the Dow (electrolytic) process.

Heavy minerals found in trace amounts in the Athabasca Oil Sands are rich in titanium minerals and zircon. They become concentrated in the secondary tailings stream during oil sands processing, to a level where the tailings constitute a potential source of titanium and zirconium metals. Oil sand processing also effects a concentration of vanadium and nickel in the residual bitumen coke. It may become feasible to recover these metals from the coke ash, where the coke is burned as fuel.

Construction workers operating "The Mole" used to excavate Edmonton's Light Rail Transit underground system.

Construction

The fortunes of the construction industry reflect the trends in general economic activity in the province. Between 1971 and 1981 the value of construction rose from \$1.8 billion to \$14.5 billion. The forecast for 1984 was \$11.2 billion. The industry had set spending records annually until 1981 due to rapidly expanding markets for office space and residential accommodations, and to forecasts of petroleum related expansions of industrial installations. These resulted in gluts of both office space and residential accommodations when the forecasts failed to materialize and the national economy faltered. The numbers of dwelling starts fell from annual rates of around 30,000 per annum to just over 13,000. The values of building permits decreased from a high of over \$5 billion to below \$2 billion. Employment in the industry decreased by one third -- from 150 thousand to around 100 thousand.

A measure of the confidence of the business community in the economic future of the province is the fact that engineering construction volume held up remarkably well. Investment expenditures on gas and oil related facilities, on electric power facilities, and on railways, telephone and telegraph facilities, all continued at relatively high levels. The proportion of the engineering construction expenditures increased from 55 per cent to 65 percent of total construction expenditures.

Apart from street, waterworks and sewage system construction, most



TABLE 2.23

VALUE OF
CONSTRUCTION
WORK
PERFORMED, BY
PRINCIPAL TYPE OF
CONSTRUCTION -
ALBERTA - 1971
AND 1981-1984

	1971 % of Total		1981 % of Total		1982 % of Total		1983 % of Total		1984* % of Total	
Building Construction	865	46.9	6,378	44.0	6,053	42.0	4,762	40.3	3,920	35.0
Residential	465	25.0	2,830	19.5	2,319	16.1	1,798	15.2	1,520	14.5
Industrial	51	2.8	419	2.9	406	2.8	272	2.3	184	1.6
Commercial	123	6.7	2,130	14.7	1,971	13.7	1,385	11.7	948	8.4
Institutional	137	7.4	605	4.2	926	6.4	944	8.0	798	7.3
Other Building	62	3.4	395	2.7	431	3.0	365	3.1	380	3.4
Engineering Construction	981	53.1	8,112	56.0	8,349	58.0	7,045	59.7	7,282	65.0
Road, Highway & Aerodrome	143	7.7	859	5.9	1,009	7.0	843	7.1	833	7.4
Waterworks & Sewage System	46	2.5	434	3.0	474	3.3	519	4.4	443	4.0
Dams & Irrigation	12	0.7	158	1.0	156	1.1	142	1.2	143	1.3
Electric Power	82	4.4	454	3.1	773	5.4	595	5.0	523	4.7
Railway, Telephone & Telegraph	61	3.3	363	2.5	339	2.4	362	3.1	320	2.9
Gas & Oil Facilities	563	30.5	5,291	36.5	5,131	35.6	4,066	34.4	4,572	41.0
Other Engineering	73	4.0	551	3.8	463	3.2	509	4.3	441	3.9
Total	1,846	100.0	14,490	100.0	14,403	100.0	11,806	100.0	11,202	100.0

TABLE 2.24

DWELLING STARTS
BY MONTH,
URBAN CENTRES
OF 10,000
POPULATION AND
OVER - ALBERTA -
1971-1983
(NUMBER)

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1971	843	1,405	1,197	2,371	2,062	1,978	2,077	2,178	2,671	1,884	1,707	1,333	21,706
1972	665	1,260	1,444	1,702	2,507	2,561	1,484	1,730	1,513	1,216	1,368	921	18,363
1973	1,071	793	1,339	1,605	1,582	1,849	1,507	1,598	1,418	1,586	1,488	1,206	17,037
1974	1,174	1,044	1,213	1,648	1,365	1,904	1,165	674	1,046	850	1,314	804	14,201
1975	687	671	813	1,085	1,304	1,688	1,599	1,658	2,435	2,253	2,638	2,762	19,593
1976	1,376	2,516	1,755	2,916	2,299	2,102	2,894	2,514	2,403	1,518	2,813	2,007	28,113
1977	894	1,315	1,262	2,660	2,945	2,523	2,697	3,497	3,263	2,228	3,377	3,348	30,009
1978	3,265	3,333	3,369	2,174	2,473	3,089	3,631	2,959	3,332	3,057	4,503	2,345	37,530
1979	3,349	2,062	2,417	2,157	2,741	2,621	2,332	2,697	1,949	2,829	2,769	2,237	30,160
1980	1,536	1,436	1,410	1,912	1,904	1,970	2,788	2,399	2,953	2,359	2,812	2,251	25,730
1981	2,193	1,454	1,767	3,017	3,873	3,311	2,876	2,672	3,373	2,290	2,736	3,610	33,172
1982	2,204	1,406	1,237	2,430	1,960	3,928	2,531	1,055	1,245	1,347	1,567	860	21,768
1983	1,325	1,346	908	1,205	2,351	1,815	755	934	661	850	636	470	13,256

engineering construction work takes place away from the main population concentrations. Building construction, by dollar volume, is mostly in the vicinity of the cities. Over two-thirds is in or near Calgary and Edmonton.

Construction volumes should not be compared solely on the basis of building permit values. The basic criteria for assigning values to the permits differ both

among the issuing authorities and over time. Some municipal authorities do not require or issue permits, and not all types of construction require permits.

Industrial building, in particular, tends to be excluded from permit requirements by definition or practice. Building codes and safety standards, on the other hand, are fairly consistent.

TABLE 2.25

**DWELLING STARTS,
COMPLETIONS
AND UNDER
CONSTRUCTION AT
YEAR END -
ALBERTA AND
CENTRES OF OVER
10,000
POPULATION 1971
AND 1978-1983
(UNITS)**

	1971	1978	1979	1980	1981	1982	1983
Alberta (All Areas)							
Dwelling Starts	25,602	47 925	39 947	32,031	38,470	26 789	17,134
Completions	20,829	43,025	44,292	34,717	34,755	31 364	24 693
Under Construction	15,320	31,323	25,454	20,378	22,960	17 663	8,336
Edmonton Metro*							
Dwelling Starts	11,256	17 065	12,298	9 967	11,999	9,738	6,453
Completions	8,252	15,567	15,573	9,996	11,270	10 369	9,055
Under Construction	8,096	11,725	7,407	6,884	6,979	6,432	3,051
Edmonton Proper							
Dwelling Starts	9 451	14,668	9,682	8,446	10,517	9,111	5,121
Completions	6,634	13,574	12,641	8 176	9,641	9 546	7,761
Under Construction	7,268	10,111	6,136	5,995	6,278	5,896	2,546
Calgary							
Dwelling Starts	8,801	15,382	12,383	11,104	15,172	9,599	4 882
Completions	7,738	13 708	13,410	12,067	12,712	12,036	8,977
Under Construction at year end	4,768	10,293	9,179	7,978	10,373	7,153	2,428
Camrose							
Dwelling Starts	N/A	280	173	173	167	127	66
Completions	N/A	200	267	117	282	93	104
Under Construction	N/A	220	67	123	40	73	51
Fort McMurray							
Dwelling Starts	N/A	312	606	810	1,222	406	126
Completions	N/A	919	471	901	807	886	200
Under Construction	N/A	245	356	262	677	187	112
Grande Prairie							
Dwelling Starts	307	749	1,436	795	314	4	111
Completions	242	416	925	1,010	955	96	93
Under Construction	184	494	1,024	751	93	2	20
Lethbridge							
Dwelling Starts	700	1,189	605	491	1,330	527	581
Completions	864	1,121	702	451	880	848	838
Under Construction	201	692	526	423	726	478	213
Lloydminster (Alberta Portion)							
Dwelling Starts	N/A	325	521	288	264	136	70
Completions	N/A	83	301	594	277	107	172
Under Construction	N/A	311	526	109	95	124	22
Medicine Hat							
Dwelling Starts	153	573	760	721	856	471	228
Completions	91	793	715	721	872	471	221
Under Construction	95	336	334	333	315	113	107
Red Deer							
Dwelling Starts	459	1,656	1,378	1,381	1,848	558	491
Completions	320	1,387	1,713	1,436	1,405	1,361	491
Under Construction	214	1,005	880	813	1,249	420	353
St. Albert							
Dwelling Starts	693	674	752	420	640	294	676
Completions	383	469	784	584	597	319	696
Under Construction at year end	469	504	472	305	319	320	239

*Edmonton (Metro) includes Fort Saskatchewan, St. Albert, Morinville, Gibbons, Bon Accord, Legal, Strathcona County No. 20 and Sturgeon M.D. 90.

Source: Statistics Canada, Housing Starts and Completions, Cat. No. 64-002

TABLE 2.26

VALUE OF
BUILDING PERMITS
- CENSUS
DIVISIONS AND
SELECTED
MUNICIPALITIES -
ALBERTA - 1971
AND 1978-1983
(THOUSANDS OF
DOLLARS)

	1971	1978	1979	1980	1981	1982	1983
Census Division 1	5,239	57,233	66,450	67,159	71,782	54,820	48,550
Medicine Hat	3 916	44 956	56 979	57 890	54 475	47 277	36 116
Redcliff	848	4 505	3 033	4 144	3 683	2 394	828
Census Division 2	22,880	97,101	101,445	95,013	123,297	97,297	99,088
Lethbridge	18 016	56 151	47 277	61 510	89 516	66 414	54 736
Brooks	1 373	13 886	9 589	11 531	5 044	2 451	2 265
Coldale	1 008	5 612	4 362	2 980	2 837	2 374	4 412
Taber	1 156	4 806	8 618	4 261	7 584	3 052	8 531
Census Division 3	3,706	14,002	26,613	15,837	18,820	16,979	30,265
Cardston	614	1 348	12 773	718	1 071	490	1 443
Claresholm	1 731	2 999	3 094	6 129	3 893	2 275	1 891
Fort Macleod	219	2 377	2 434	1 098	1 748	1 254	14 690
Census Division 4	461	3,438	6,958	3,179	7,609	9,442	4,292
Census Division 5	1,925	20,918	24,608	23,790	28,316	52,459	19,737
Drumheller	1 261	5 921	5 104	6 950	6 211	11 947	2 356
Census Division 6	200,254	1,132,534	1,232,660	1,561,990	2,602,121	1,164,720	465,107
Calgary	193 335	1,052 743	1,103 037	1 394 374	2 445 479	1 251 459	410 622
Airdrie	488	18 105	31 652	39 472	43 215	21 377	9 442
Cochrane	324	10 186	11 131	6 826	7 083	5 448	2 695
Didsbury	130	3 827	3 703	2 646	5 410	14 257	2 561
High River	521	713	8 456	16 466	9 467	6 053	4 454
Okotoks	178	4 637	8 105	19 436	18 245	20 752	2 971
Olds	744	10 755	9 597	5 507	4 751	4 128	2 476
Census Division 7	1,905	19,498	28,508	19,127	18,032	27,518	30,522
Stettler	532	6 893	9 007	4 301	5 132	2 741	1 761
Wainwright	452	3 988	8 058	3 253	5 527	13 539	9 516
Census Division 8	15,396	173,250	178,387	191,850	220,005	111,025	95,957
Red Deer	9 264	104 452	99 041	116 963	120 594	50 943	47 855
Innisfail	364	13 703	8 046	13 476	7 697	2 225	2 122
Lacombe	521	6 138	11 523	3 297	9 111	18 259	2 059
Ponoka	435	3 374	4 773	6 857	4 440	2 717	3 225
Rocky Mountain House	2 008	11 979	7 651	7 852	5 957	9 974	3 535
Sylvan Lake	251	7 743	7 330	2 281	2 573	1 974	1 599
Census Division 9	5,680	24,679	44,434	41,491	68,001	50,486	27,226
Banff	2 786	11 079	22 191	19 268	13 398	14 410	11 490
Canmore	574	3 710	11 021	14 145	10 339	19 695	8 030
Crowsnest	627	2 723	9 128	3 260	7 773	12 073	4 723
Jasper		1 170	4 226	3 354	31 396	1 465	1 120
Census Division 10	7,235	99,682	102,725	90,203	73,306	50,398	63,971
Camrose	2 420	14 232	13 796	16 521	19 415	12 130	13 809
Lloydminster	2 352	40 436	38 938	32 493	20 785	9 116	13 901
Vegreville	515	20 307	8 933	9 836	8 049	11 479	3 473
Vermilion	435	3 742	15 616	13 129	5 449	6 653	14 272
Census Division 11	242,121	1,084,770	1,115,277	1,675,800	1,512,132	1,042,474	771,772
Edmonton (Metro)	223 997	938 166	985 886	1 269 933	1 374 132	915 824	688 588
Edmonton (Proper)	166 028	723 222	761 723	843 057	1 137 555	778 242	582 284
St. Albert	10 273	36 578	45 957	41 202	76 228	46 028	34 845
Wetaskiwin	1 589	17 309	12 418	14 225	16 528	9 471	12 151
Devon	541	2 470	3 289	4 572	6 747	20 903	3 786
Drayton Valley	2 053	9 724	7 841	10 088	1 749	18 796	2 623
Fort Saskatchewan	3 210	33 588	19 923	8 800	13 262	8 070	7 879
Leduc	3 483	20 897	24 610	19 647	18 138	10 775	13 823
Morinville	271	12 684	12 259	7 845	5 410	2 714	8 499
Spruce Grove	4 773	8 329	10 809	21 321	20 317	5 349	7 519
Stony Plain	1 027	9 943	8 847	12 656	12 802	8 154	11 831
Census Division 12	9,263	105,729	126,493	116,081	150,635	53,372	52,157
Fort McMurray	2 919	54 894	57 521	78 142	108 706	28 024	14 722
Bonnyville	1 369	15 730	18 150	8 211	2 678	1 538	4 061
Grand Centre	2 144	4 559	10 985	6 354	2 253	1 588	86
St. Paul	1 213	5 515	11 111	6 416	4 755	1 420	4 214
Census Division 13	3,148	47,198	48,144	40,796	55,893	23,134	39,562
Barrhead	450	4 488	3 509	6 199	11 601	924	13 782
Westlock	1 165	4 881	9 194	6 384	5 077	3 935	4 063
Whitecourt	1 082	17 682	10 040	9 392	17 973	4 036	2 089

TABLE 2.26

CONTINUED

	1971	1978	1979	1980	1981	1982	1983
Census Division 14	6,635	38,495	24,694	35,669	41,062	32,070	16,498
Edson	1,728	14,605	8,659	8,302	15,709	9,541	2,727
Hinton	2,479	17,925	13,775	18,745	11,090	14,611	8,330
Census Division 15	19,238	115,297	227,170	193,041	141,929	124,809	106,255
Grande Prairie	8,095	46,282	102,443	84,937	29,554	53,044	18,160
Fairview	707	3,635	3,201	11,354	17,861	1,471	6,131
Grande Cache	1,809	921	317	3,861	7,237	683	43,400
Peace River	1,387	17,155	15,409	7,891	4,002	3,092	4,297
Slave Lake	2,075	3,735	8,203	12,485	11,909	3,600	3,554
Total Alberta	545,084	3,033,824	3,354,566	4,022,158	5,130,940	2,911,003	1,870,959

Edmonton (Metro) includes Bon Accord, Edmonton, Fort Saskatchewan, Gibbons, Legal, Morinville, St. Albert, Strathcona County No. 20 and Sturgeon M.D. 90.

Source: Statistics Canada, Building Permits, Cat No. 64-203

TABLE 2.27

**VALUE OF
BUILDING PERMITS
BY TYPE - SELECTED
CITIES - ALBERTA -
1971 AND 1978-
1983
(THOUSANDS OF
DOLLARS)**

	1971	1978	1979	1980	1981	1982	1983
Alberta							
Residential	322,286	1,650,409	1,805,956	1,743,694	2,373,167	1,059,328	809,209
Industrial	32,852	157,886	149,717	484,056	209,674	124,814	82,258
Commercial	111,433	954,378	1,107,922	1,348,864	2,069,893	1,005,323	470,640
Institutional and Government	78,513	271,151	290,971	438,423	478,206	751,538	508,852
Total	545,084	3,033,824	3,354,566	4,015,037	5,130,940	2,911,003	1,870,959
Edmonton (Metro) *							
Residential	142,742	600,899	522,720	462,289	627,545	387,406	288,194
Industrial	18,833	51,354	32,761	433,841	46,186	50,863	17,588
Commercial	41,058	204,542	339,587	389,815	578,996	282,761	190,951
Institutional and Government	21,364	81,371	90,818	155,960	121,405	194,794	191,855
Total	223,997	938,166	985,888	1,441,905	1,374,132	915,824	688,588
Edmonton (Proper)							
Residential	106,865	470,254	403,236	360,274	527,438	339,789	217,707
Industrial	5,643	20,085	12,252	18,682	18,987	32,369	10,408
Commercial	34,955	165,893	266,035	330,804	496,341	243,328	172,428
Institutional and Government	18,565	66,990	80,200	133,297	94,789	162,756	181,741
Total	166,028	723,222	761,723	843,057	1,137,555	778,242	582,284
Calgary							
Residential	101,739	458,296	612,102	655,135	1,075,033	304,882	192,013
Industrial	8,099	29,729	41,566	59,578	39,779	19,290	29,586
Commercial	48,361	493,685	418,547	607,407	1,178,401	585,371	153,295
Institutional and Government	35,136	71,033	30,822	72,254	152,266	141,916	35,728
Total	193,335	1,052,743	1,103,037	1,394,374	2,445,479	1,051,459	410,622
Lethbridge							
Residential	10,586	39,872	21,404	23,186	51,561	32,182	35,025
Industrial	722	4,494	5,545	4,228	6,765	5,488	1,361
Commercial	3,300	8,707	18,591	19,390	20,474	10,629	4,051
Institutional and Government	3,408	3,078	1,737	10,686	10,716	18,115	14,299
Total	18,016	56,151	47,277	57,490	89,516	66,414	54,736
Medicine Hat							
Residential	2,499	27,572	29,672	35,153	34,615	11,819	13,985
Industrial	169	1,960	2,194	5,852	1,185	361	109
Commercial	677	14,217	20,587	12,984	9,373	7,071	4,246
Institutional and Government	571	1,207	4,526	3,901	12,302	28,026	19,676
Total	3,916	44,956	56,979	57,890	57,475	47,277	38,016

CONTINUED

[illegible]

VALUE OF
CONSTRUCTION
WORK PERFORMED
BY DETAILED TYPE
OF
CONSTRUCTION -
ALBERTA - 1971
AND 1979-1984
(MILLIONS OF
DOLLARS)

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TABLE 2.28

CONTINUED

	1971	1979	1980	1981	1982	1983	1984 ^(f)
Gas and Oil Facilities	563	3,093	4,491	5,291	5,131	4,066	4,572
Gas Mains and Services	10	48	58	-	-	-	-
Oil and Gas Pipe Lines	49	91	223	115	518	255	213
Oil and Gas Wells	278	2,661	3,892	3,862	3,462	3,211	3,888
Natural Gas Processing Plants	198	274	274	360	484	246	258
*Other	28	18	44	954	667	354	213
Other Engineering	73	238	441	551	463	509	441
Bridges, Trestles, Culverts, Viaducts	22	70	85	81	84	69	15
Other	51	168	356	470	379	440	426
Total Construction	1,846	9,373	11,693	10,242	9,133	9,146	8,798
Salaries and Wages	627	3,388	3,830	4,356	4,089	3,303	2,976
Cost of Materials Used	771	3,354	4,904	5,882	6,091	5,006	4,809
Number of Employees ('000)	82	141	155	152	150	115	98

f - Forecast

* - Includes confidential figure

Source: Statistics Canada, Construction Industry, Catalogue No. 22-20

Forestry

Sixty per cent of Alberta is covered by forest, constituting an approximate area of 390,000 square kilometres. The forests contain nearly 1.7 billion cubic metres of wood material. Alberta ranks fourth among Canadian provinces both in terms of merchantable timber volume and productive forest area.

Of the forest area, approximately 164,000 square kilometres are classified as timbered with a further 72,000 square kilometres regarded as suitable for timber after they have been restocked. An area of 154,000 square kilometres is classified as unsuitable terrain; it includes muskeg and bushland areas. The major portion of the forest land is in the Boreal Forest Region. There are also Subalpine and Montane Forest Regions on the eastern slopes of the Rocky Mountains.

Of the 164,000 square kilometres of timbered forest land, approximately 41 per cent is covered with coniferous, 27 per cent with deciduous, and 32 per cent with mixed coniferous and deciduous trees. Spruce, pine, fir, poplar, and birch are the predominant species.

Forest-based industries account for approximately 12 per cent of the value of manufactured goods in the province. Coniferous timber quota operations have an authorized annual cut of approximately 3 million cubic metres primarily for the production of lumber, plywood, and round timbers. In addition, Forest Management Agreements have been established allowing an annual cut of about 4.3 million cubic metres. There is room for expanded forest production,

including major pulp mills and sawmilling facilities, while maintaining the net volume of timber growth. The present annual cut of trees is in the order of 6 million cubic metres coniferous, and 500,000 cubic metres deciduous.

The annual allowable cut is over 14 million cubic metres coniferous, and over 11 million cubic metres deciduous.

Over the past two decades, there has been a significant change in the proportions of forestry production. Prior to 1956, lumber manufacture accounted for 85 per cent by volume of total forest production. In the mid 1970's lumber accounted for about 60 per cent of the total, due to an increase in the production of pulpwood and round timber. This shift was partly caused by the commencement of operations of large pulp mills at Hinton in 1956 and near Grande Prairie in 1973.

Now lumber and plywood accounts for approximately 85 per cent of the total timber being harvested in the province. This is as a result of the pulp mills reducing their demand for roundwood by substituting wood chip residues from lumber production. Wood chip production has quadrupled in the last ten years.

The large new capital facilities being built reflect the increasing modernization of the Alberta forest industry and are considered a mainstay for the maintenance of a favourable competitive position in world lumber markets.

A vital aspect of forest management is that of reforestation. With the implementation of a sustained yield policy, the task of reforestation was taken on by government and the timber industry. Regeneration requirements are set and surveys regularly conducted on harvested areas. Minimum stocking standards are enforced.

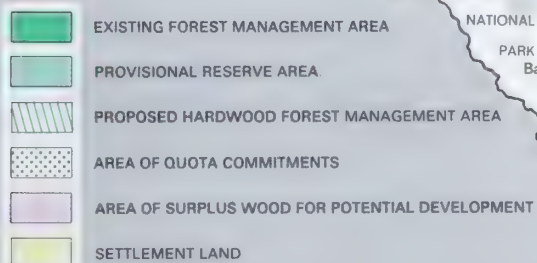
The Pine Ridge Forest Nursery,

constructed through funding from the Alberta Heritage Savings Trust Fund, will ultimately supply 18 million bareroot and 20 million container stock annually for Alberta industry and government reforestation and afforestation programs. The facility is projected to sustain an adequate supply of seedlings for these programs for at least the next decade.





FOREST INDUSTRY DEVELOPMENT AREAS 1984



St. R.	St. Regis (Alberta) Ltd.
C.F.P.	Canadian Forest Products Ltd.
P.G.	Proctor and Gamble Company of Canada Ltd.
A.E.C.	Alberta Energy Company Ltd.
W.	Weldwood of Canada Ltd.

Produced by the Alberta Bureau of Surveying and Mapping © 1984

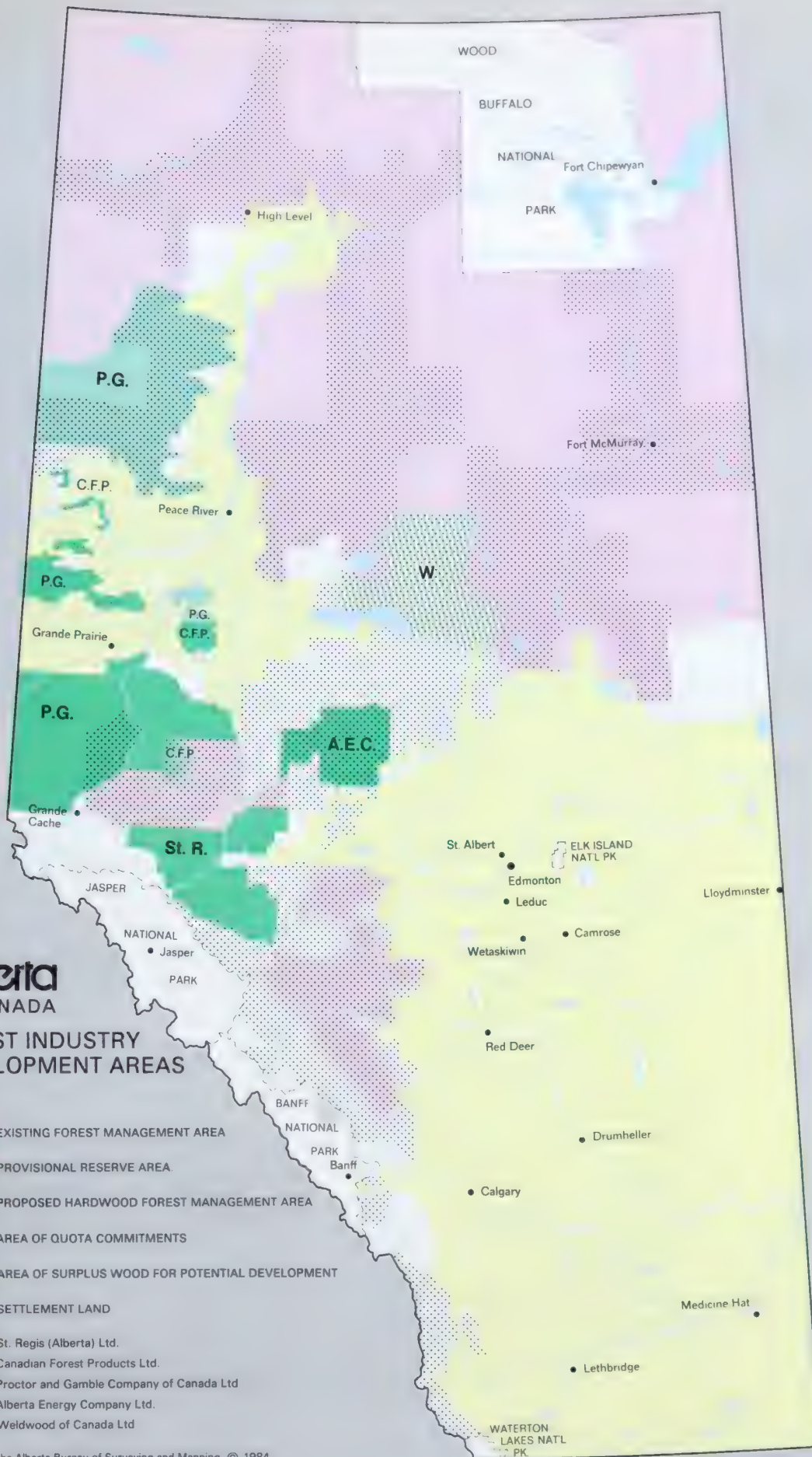


TABLE 2.29

AREA - CROWN
AND PRIVATE
LAND - ALBERTA
- 1983

	km ²	Per Cent
Crown Land	479,604	73
Federal (National Parks, Department of National Defence)	63,056	10
Provincial (Parks, Wilderness Areas non-settled public lands)	416,548	63
Private Lands	181,381	27
Provincial Total	661,185	100

Source: Alberta Forest Service

TABLE 2.30

MANAGED FOREST
LANDS, BY FOREST
- ALBERTA - 1982

Forest	Area of Managed Forest Land (km ²)	Per Cent of Total Area of Managed Forest Land
Athabasca	60,810	18
Bow/Crow	11,937	4
Clearwater/Rocky	15,488	5
Edson	20,813	6
Footner Lake	74,835	23
Grande Prairie	18,775	6
Lac La Biche	25,850	8
Peace River	33,830	10
Slave Lake	51,150	15
Whitcourt	17,392	5
Total	330,880	100

Source: Alberta Forest Service

The Crown is Alberta's principal landowner. Except for carefully selected areas which are suitable for agriculture, the provincial government retains title to these lands and only grants rights (such as mineral or timber) to the private sector under specified terms and conditions. Timber harvesting authorization is obtained by acquiring a Forest Management Agreement, Timber Quota or Timber Permit.

About 331,000 square kilometres of forest area are now subdivided into over 100 Forest Management Units in ten Forest Administration Regions. Based on current inventories (together with recognition of multiple forest uses), an annual allowable cut and cut progression schedule is developed under a timber management plan for each management unit to ensure a sustained supply of forest products from that unit.

Prospective Forest Management Areas, called Timber Development Areas, are publicly advertised and company development proposals invited. Company representatives are required to outline their proposals at public hearings to assure those present that sound forest

management practices will be followed and that environmental and social factors will be considered. The selection of the successful company is made by the Executive Council of the Province of Alberta.

The Alberta Forest Service then negotiates a Forest Management Agreement with the company, with terms and conditions based primarily on the company submission made at the public hearings. Such an Agreement is entered into when the applicant agrees to construct a pulpmill, plywood plant or some other capital facility. Each Agreement provides the holder with harvesting rights over extensive areas of commercial timber at specified dues, rates, and under specific conditions. The land within a Forest Management Area must be managed on a sustained yield basis to ensure continued production. All Agreements require the holder to conduct inventories, develop management and annual operating plans, and reforest all cutover areas. The Forest Management Agreement negotiated with the company is then approved by Cabinet.

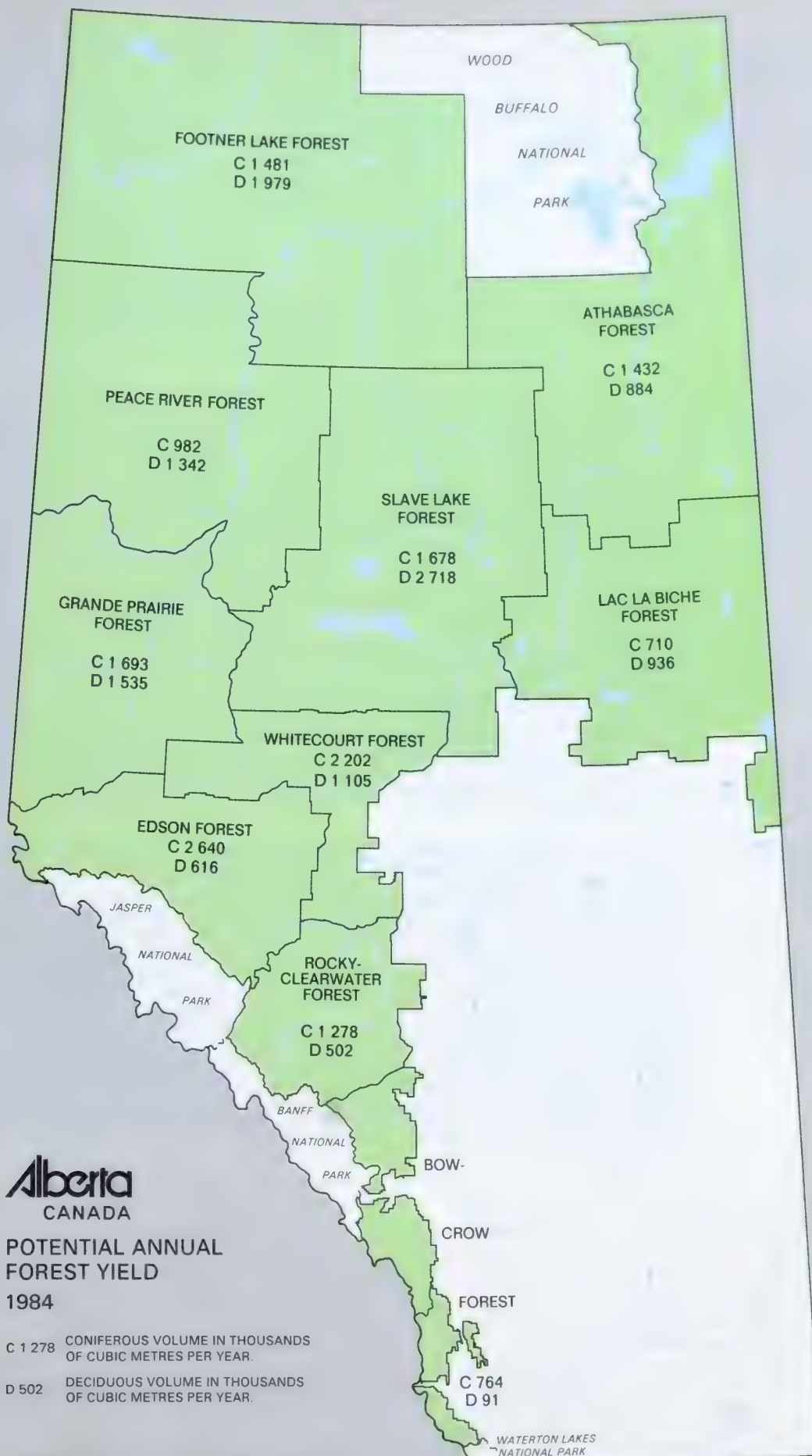


TABLE 2.31

TIMBER VOLUMES
BY SPECIES
ALBERTA

Species	Diameter (cm)	Volume (10 ³ m ³)	Per Cent
Coniferous:			
Spruce, White	10 - 24	195.4	11
Spruce, White	25 & over	274.7	16
Pine, Jack & Lodgepole	10-24	297.3	18
Pine, Jack & Lodgepole	25 & over	152.9	9
Spruce, Black	10 & over	70.8	4
Fir, Balsam	10 & over	31.1	2
Deciduous:			
Poplar and Birch	10 & over	668.3	40
Total		1,690.5	100

Source: Alberta Forest Service

TABLE 2.32

FOREST
PRODUCTION BY
VOLUME AND
VALUE ON CROWN
LANDS - ALBERTA -
1983-1984

Product	Units	Volume	Value (\$)
Lumber & Plywood Logs			
Coniferous	m	5 821 453	293 188 556
Deciduous	m	351 875	13 761 831
Round Timber	m	188 253	14 363 704
Pulpwood	m	815 942	14 238 188
Wood Chips	m	1 303 947	14 382 535
Fuelwood	m	124 416	2 584 120
Slabs	m	593	22 172
Railway Ties	m	12 643	760 097
Sub Total*		7,314,091	353,301,203
Christmas Trees	number	42 605	127 815
Trees for Transplanting	number	20 842	41 684
Total			353,470,702

Source: Alberta Forest Service

* Above figures do not include wood chips and sawdust

TABLE 2.33

ANNUAL VOLUME
OF TIMBER
PRODUCTION ON
CROWN LANDS, BY
TYPE OF PRODUCT
- ALBERTA FISCAL
YEARS 1974-84
(THOUSANDS OF
CUBIC METRES)

	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Average
Lumber											
Coniferous	1,707	2,143	2,580	2,885	2,937	3,911	3,783	4,064	4,123	5,822	3,395
Deciduous	52	24	3	12	25	18	106	132	116	352	84
Roundwood	133	99	181	217	82	171	148	150	161	188	153
Pulpwood	2,211	1,731	1,582	1,651	1,547	1,587	1,326	1,115	1,012	816	1,458
Fuelwood	13	11	49	46	60	64	66	86	131	124	65
Railway Ties	34	48	35	28	22	14	24	18	18	13	25
Woodchips	240	160	317	539	880	798	790	860	853	1,304	674
Total	4,390	4,217	4,747	5,377	5,552	6,563	6,243	6,424	6,414	8,619	5,855

Source: Alberta Forest Service

TABLE 2.34

**REFORESTATION
ACTIVITY, ALBERTA
FOREST SERVICE
(AFS) AND
ALBERTA FOREST
INDUSTRY (AFI)
FIRMS - ALBERTA
-1971/72-1983/84**

Year		Area Scarified (hectares)	Area Seeded (hectares)	Area Thinned (hectares)	Seed Extracted (hectares)	Seedlings Planted Conventional* (kg)	Seedlings Planted (T.O.O.)	Container (T.O.O.)
1971-72	AFS	7,243	5,385		1,374	1,107	1,655	513
	AFI	5,452	217			92		644
1972-73	AFS	6,979	4,701		100	311	333	1,127
	AFI	5,501	1,745			283	40	929
1973-74	AFS	6,594	1,332		108	449	1,228	1,335
	AFI	6,793	1,939			386	64	958
1974-75	AFS	6,296	2,047		72	2,381	1,141	1,224
	AFI	6,334	2,313			1,603	140	3,124
1975-76	AFS	6,697	1,885		104	3,441	944	3,515
	AFI	10,840	2,862		40	4,461	1,329	1,733
1976-77	AFS	4,757	2,898		546	9,089	828	2,295
	AFI	9,849	3,427		37	6,984	104	3,285
1977-78	AFS	6,684	4,782		111	2,327	224	2,379
	AFI	10,292	5,328		20	1,143		4,254
1978-79	AFS	10,140	4,655		26	26,787	94	2,081
	AFI	9,724	1,691		365	1,248	45	6,165
1979-80	AFS	6,324	3,325		16	14,014		4,899
	AFI	8,819	2,218		256	9,123		5,430
1980-81	AFS	6,102	4,687			4,365	769	3,754
	AFI	6,484	1,948		216	1,696	30	6,774
1981-82	AFS	5,964	3,127		251	1,159	5,914	2,247
	AFI	7,604	1,574		383	460	142	6,484
1982-83	AFS	8,131	3,212		543	8,638	3,491	3,712
	AFI	8,480	2,158		152	504	2,729	4,202
1983-84	AFS	8,532	3,331		720	6,493	4,202	6,358
	AFI	11,489	3,357		27	9,405	1,754	4,354

Source: Alberta Forests Service

*Includes wildlings

Most other commercial timber operations are conducted under the authority of timber quotas. Where timber is available for harvesting, a quota may be authorized and offered for competitive sale at public auction. In order to provide security of tenure, quotas are generally established for twenty-year periods with the volume of production regulated over five-year periods. Actual harvesting is authorized by issuance of successive timber licences. A licence is issued once a quota holder has submitted his performance deposit, paid assessed fees and costs associated with establishment of the quota and licensing, and complied with all regulations.

Commercial Timber Permits (C.T.P.'s) may be offered by competitive auction sale where a surplus annual allowable cut is present or has accumulated (usually as a result of an

undercut by a quota holder) in a management unit. When there is reason to require prompt removal of timber if it is dead, diseased, damaged, or is in a development or research area, a C.T.P. may be issued without competition. Generally, C.T.P.'s are held by small operators not desiring or unable to obtain a quota in a Forest Management Unit. These permits are issued for a short term, usually one to three years.

Local Timber Permits (L.T.P.'s) were primarily established to provide local residents with the opportunity to harvest timber for their own use, or for sale, if approved for the particular Forest Management Unit. Volume of timber harvested is limited and permits are restricted to a one-year term.

These forest policies are designed to ensure that Alberta will have a viable forest industry over the long term. They reflect a determination to maintain the benefits that accrue to the province from the natural beauty, wildlife, and recreational potential of the forests.

Commercial Fishing

Although Alberta has over 150 lakes in which commercial fishing is permitted, only about 90 are fished during a given year. Most of the catch is landed during the winter when prices for most types of fish are higher.

The province is divided into eight commercial fishing zones for licensing purposes. In 1983 a freeze on new entry to the commercial fisheries was established as a first step in the development of a limited access commercial fishery. Prior to 1983 Alberta commercial fisheries were treated as open access fisheries. In 1983-84 there were about 3,000 people eligible for commercial fishing licences and about 2,200 actually participated in fishing.

TABLE 2.35

**FISHERIES
PRODUCTION -
ALBERTA
-1961-1984**

	Tonnes	(\$ 000)
1961	7 584	2 179
1962	4 202	1 416
1963	4 100	1 141
1964	4 037	1 174
1965	5 578	1 243
1966	4 034	1 188
1967	4 766	1 397
1968	4 735	1 560
1969	5 437	1 466
1970	4 902	1 728
1971	3 128	1 588
1972	2 425	1 411
1973	2 204	1 476
1974	2 092	1 434
1975	2 376	1 754
1976	1 946	1 696
1977	1 965	2 165
1978	2 119	2 170
1979	2 023	2 374
1980	2 014	2 818
1981	2 486	3 326
1982	2 245	3 213
1983	2 380	1 791
1984	1 916	1 658

Source: Alberta Fish and Wildlife Commission

The mainstay of the Alberta commercial fishery is whitefish. Northern pike, tullibee and perch are also caught in much smaller quantities. Walleye and lake trout appear as small parts of the total catch, due to their limited supply in the province and allocation policies that emphasize the importance of these species as sportfish.

So-called rough fish are taken incidentally. These include lower grade tullibee, burbot and suckers. Some tullibee are sold as mink feed, but this industry no longer demands a significant part of the potential catch. There is a demand for a small amount of burbot, but this fishery is held back by low prices offered to fishermen. There is no market demand for suckers in Alberta at the present time.

The government of Alberta currently offers some freight assistance to fishermen operating in the remote northern areas of the province.

There are seven registered packing plants in Alberta operated by agents of the Freshwater Fish Marketing Corporation. These are located in Edmonton, Cold Lake, Lac La Biche, Faust, Joussard, Brooks and Fort Chipewyan. The Freshwater Fish Marketing Corporation buys all fish destined for export from the province. Currently this is about 60% of the total catch, composed primarily of whitefish and northern pike. The remainder of the catch is sold in Alberta by the fishermen directly to consumers.

Trapping

Trapping has long been an integral part and desirable tool of wildlife management as well as an intrinsic part of Canadian heritage. Some Albertans are still dependent upon the wild fur industry for their livelihood, for either a sole or supplementary income. Throughout the settled parts of Alberta, the trapping of wild fur provides an additional income for the part-time trapper as well as serving as a means of managing problem wildlife species.

Wild fur production has remained fairly stable over the years. From time to time, increases in numbers and species of animals harvested indicate increasing or peaking population levels of these species. In Alberta, no species of fur-bearing animal is in danger of extinction by trapping. Changing demands by the public and the manufacturing and design industries cause corresponding changes in the value of furs. Changing trends in fashion requirements must be catered to by fur dealers, fur auctions and brokers.

During the 1983-84 season there were 2,973 registered trappers actively engaged in trapping on Crown land. Resident trappers purchased 4,987 licences to trap on small parcels of privately owned land. During the 1980 season the total value of raw fur harvested amounted to \$15.6 million, a peak year, but declined to \$5.7 million in the 1984 season.

TABLE 2.36

**FUR PRODUCTION
AND VALUE OF
FUR PELTS -
ALBERTA
-1960-1984**

	Number	(\$'000)
1960	1,489,375	2,340
1961	1,253,378	1,433
1962	1,532,328	1,524
1963	1,111,496	1,944
1964	799,435	1,864
1965	1,110,448	1,608
1966	806,667	1,761
1967	797,896	1,784
1968	820,704	1,520
1969	646,452	1,996
1970	499,265	1,910
1971	528,015	1,706
1972	593,160	3,760
1973	548,643	6,363
1974	458,785	4,626
1975	660,379	3,330
1976	754,270	5,371
1977	1,035,675	7,225
1978	559,967	6,222
1979	543,203	1,795
1980	1,830,551	5,572
1981	797,833	2,095
1982	423,533	9,774
1983	369,214	7,597
1984	565,024	5,696

Source: Alberta Fish and Wildlife Division

Tourism

Tourism is an important industry in Alberta, contributing numerous economic and social benefits. These include business investment opportunities, employment for large numbers of people, and the provision of a variety of recreational and cultural amenities to be enjoyed by residents and visitors.

The tourist industry is comprised of

many businesses, large and small, which serve the needs of the travelling public. Airlines, hotels, restaurants, taxicabs, ski resorts, gas stations, grocery stores — these are just a few of the businesses that make up the industry. As an indication of the number of businesses involved in Alberta, in 1983 there were about 1,100 hotels and motels, 5,000 food service outlets, and about 1,000 gasoline service stations.

*Banff Springs Hotel in
the Banff National
Park, Alberta*

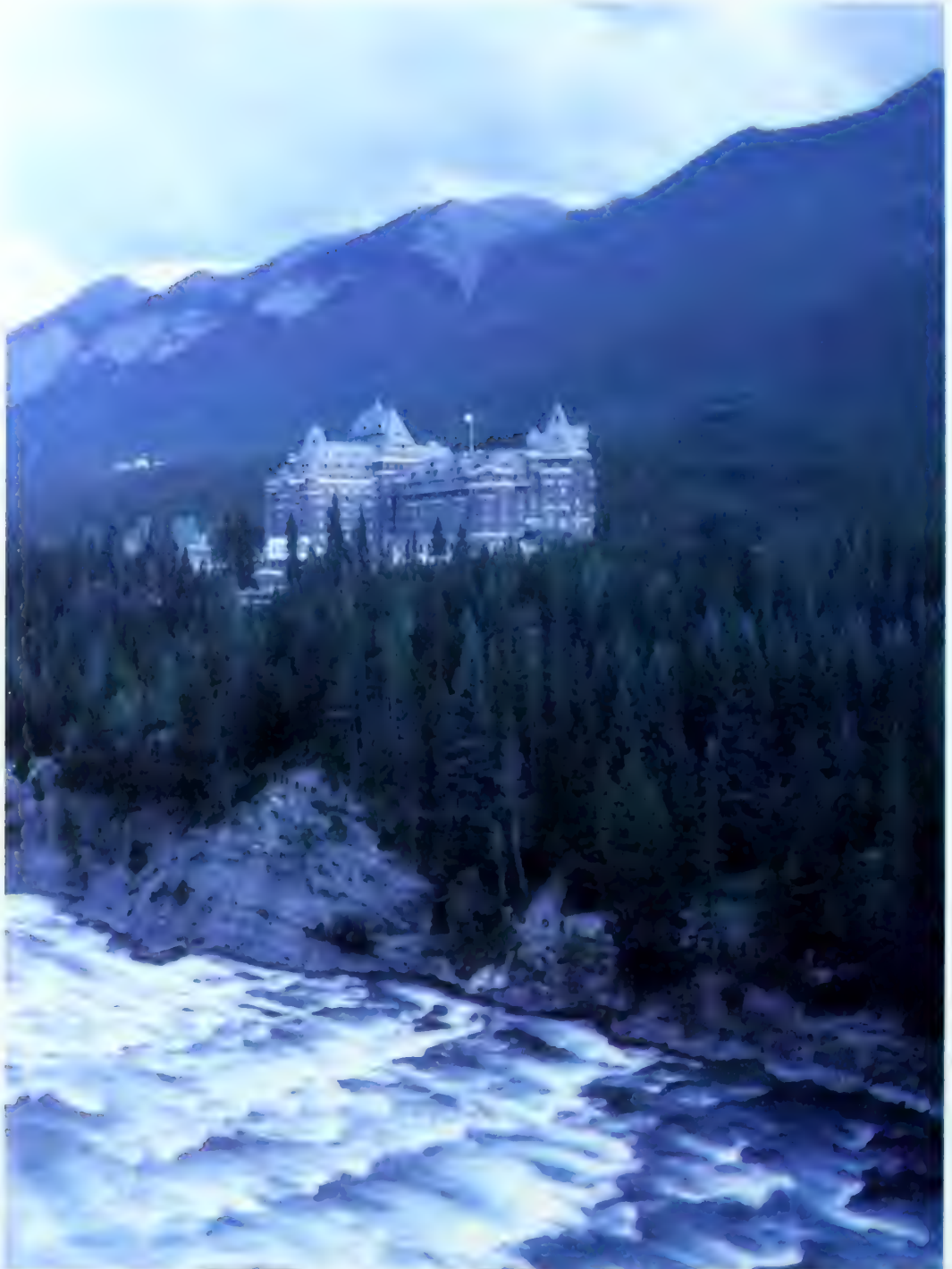


TABLE 2.37

PERSONS AND VEHICLES ENTERING THROUGH CANADA CUSTOMS PORTS, AND VISITORS TO NATIONAL PARKS - ALBERTA 1971 AND 1978-1983

	1971	1978	1979	1980	1981	1982	1983
U.S. Vehicles Entering Through Alberta/USA Border Points	N/A	134 184	115 892	129 546	139 043	110 492	105 736
Persons Entering Through Canada Customs Ports in Alberta:							
United States Visitors	497 198	447 547	416 050	451 881	485 671	464 222	455 175
Overseas Visitors	20 945	79 199	97 600	95 321	104 515	97 929	88 555
Canadian Residents Returning:							
From the U.S.	406 500	707 926	740 903	825 360	817 494	798 670	849 459
From Overseas	N/A	78 106	84 774	80 335	79 749	84 142	105 607
Number of Visitors to Alberta National Parks:							
Banff	2 498 410	3 129 797	3 506 356	3 649 124	3 913 285	3 488 674	3 195 055
Jasper	1 408 340	1 797 695	1 818 276	1 929 100	1 971 905	1 846 872	1 871 055
Waterton	559 380	657 770	663 464	667 069	642 173	679 274	670 172
Elk Island	313 557	409 063	382 064	419 802	495 970	434 358	393 696
Wood Buffalo					1 793	2 261	1 404
Total	4,779,687	5,994,325	6,370,160	6,665,095	7,025,126	6,451,439	6,131,382

Source: Statistics Canada, *Tourism Between Canada and the United States*,
Parks Canada, Visitor Services Cat. No. 96-11

TABLE 2.38

ESTIMATED TOURISM RECEIPTS FROM RESIDENT AND NON-RESIDENT TRAVEL, ALBERTA, 1971-1983 (MILLIONS OF DOLLARS)

	Alberta Travellers	Other Canadian Travellers	U.S.A. Travellers	Overseas Travellers	Total Receipts	% Growth Over Previous Year
1971	224	85	60	5	374	
1972	248	94	66	7	415	+10.7
1973	292	112	75	10	489	+17.8
1974	344	134	68	17	563	+15.3
1975	402	153	85	24	664	+18.1
1976	465	177	98	27	767	+15.3
1977	510	250	120	33	913	+19.0
1978	559	352	124	44	1,079	+18.2
1979	613	497	126	58	1,294	+19.9
1980	671	655	149	69	1,544	+19.3
1981	802	688	181	82	1,753	+13.5
1982	932	723	201	89	1,945	+10.9
1983	944	736	214	86	1,980	+1.8

Source: Alberta Tourism and Small Business



Alberta
CANADA

1984

NATIONAL PARK
PROVINCIAL PARK
FORESTRY AREA



When the full range of businesses which serve the tourist is considered, the size and diversity of the industry can be appreciated.

Because it involves so many businesses throughout the province, tourism plays a major role in the Alberta economy. In 1983 it is estimated the industry generated almost \$2 billion in revenues and employed about 80,000 people. The revenue figure is quadruple that of 1973 when revenues were \$488 million. For the decade, revenues grew at an average rate of 15 per cent annually. Real growth for the period was 4.2% annually.

Albertans, as might be expected, are the largest market, accounting in 1983 for about 48 percent of total tourist revenues and 62 percent of the total 13.8 million tourist visits (where the visit involved at least one night away from home). Residents of other Canadian provinces accounted for 37% of total revenues and 30% of total visits; U.S. residents for 11% of revenues and 6% of visits, and other foreign visitors, mainly from western Europe, for the remaining 4% of revenues and 2% of visits.

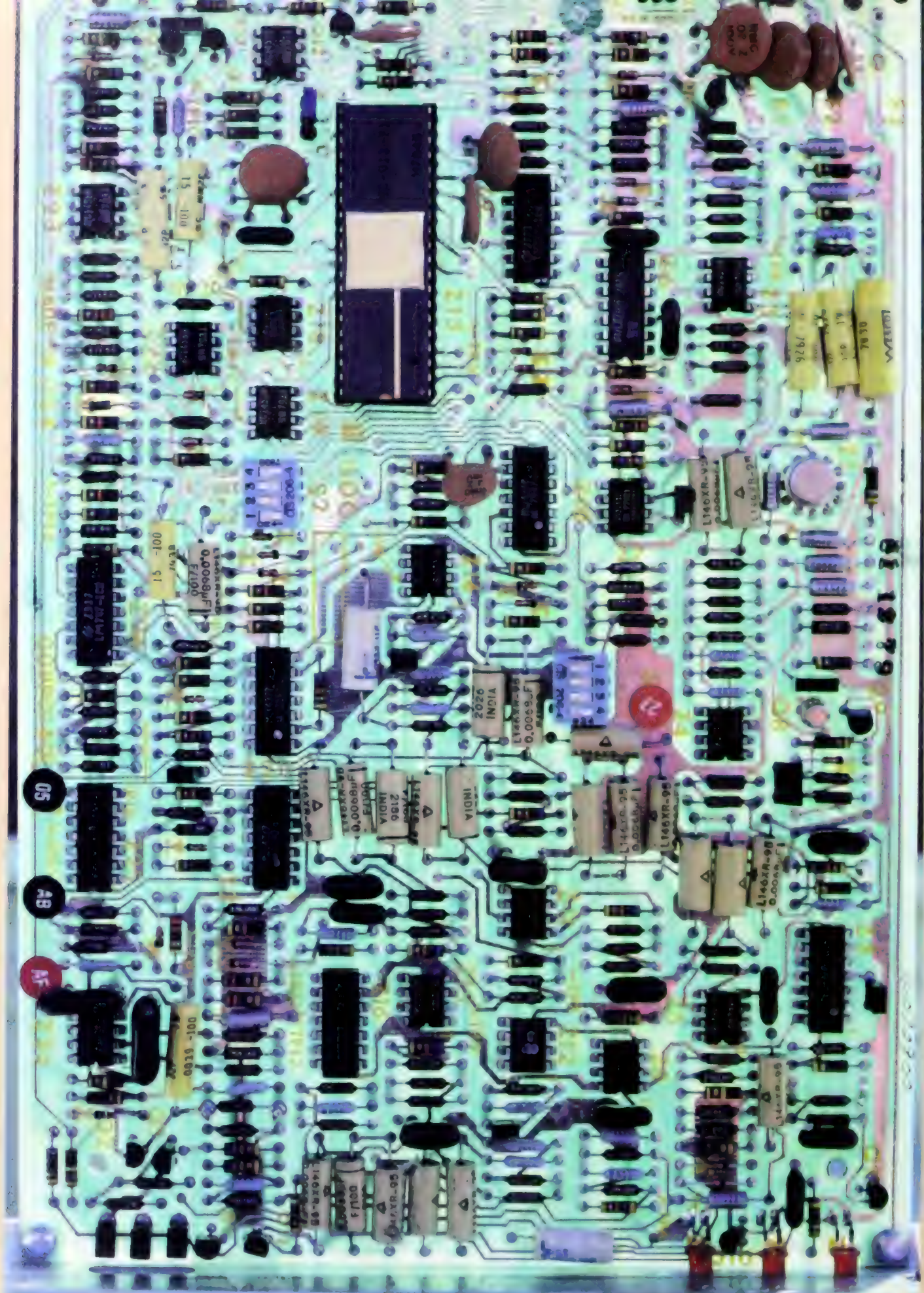
Alberta's most important non-resident markets are, in order of importance:

Canada - British Columbia, Saskatchewan, Ontario; U.S. - California, Montana, Washington, Texas; Foreign - United Kingdom, West Germany, Japan.

Although 1982-83 saw a slackening in the industry's growth, tourism in Alberta prospered during much of the decade 1973-83, along with most other sectors of the economy. Alberta's markets, both resident and non-resident, expanded during this period, accompanied by corresponding growth in the industry's capacity to accommodate visitors. Many new tourist services and attractions were developed during this period.

Alberta offers a multitude of things for the visitors to see and do. Some of the more noteworthy attractions: the spectacular Rocky Mountains, which in winter offer excellent skiing (Alberta has three Rocky Mountain National Parks: Banff, Jasper, and Waterton); Dinosaur Provincial Park, a World Heritage site, with its badlands' formations and rich deposits of dinosaur fossils; the beauty and solitude of Alberta's north country, with its excellent fishing; and the two major cities, Calgary and Edmonton, each a dynamic, cosmopolitan centre with its own unique urban attractions. For the vacationer with a sense of adventure, Alberta offers almost everything: trailrides on horseback, fly-in-fishing at remote lakes, river rafting, even winter dogsled tours.

Alberta is becoming known for major events. In addition to the annual Calgary Stampede and Edmonton Klondike Days, in recent years Alberta has hosted two major international events, the Commonwealth Games, (Edmonton, 1978) and the World University Games (Edmonton, 1983). The province is now looking forward to hosting its most important international event ever -- the XV Olympic Winter Games in Calgary in 1988.



Research and Development

Research and Development

Research and development (R & D) is defined as creative work undertaken on a systematic basis toward the acquisition and application of new scientific and technological knowledge. Included is work both in the natural sciences and engineering, and in the social sciences and humanities.

"High technology", encompasses the leading edges of advanced research and the advanced and exciting developments in all fields from agriculture and mining

to manufacturing and medical treatments and explorations of the universe. Current examples are genetic engineering, developments in microelectronics, data processing and transmission, and the placing and repairing of satellites in earth orbit.

Albertans have made, and are making, significant contributions to practical, material, advances in many fields. Prototypes of useful farm machinery such as grain driers, deep plows, and front end loaders have been developed. Important work has been done in developing new varieties of oil seeds, animal breeds, vaccines, plant and animal pest controls, forages, and plants and animals resistant to low temperatures. All-terrain vehicles for operation in muskeg and tundra, or in extreme climates, and capable of transporting heavy loads, have gained world wide acceptance. In the field of electronics, Albertans have made useful contributions to pipeline control systems, to mobile radio telephonics, and to supervisory systems for buildings. For the health sciences, they have developed biochemical diagnostic reagents for blood fractions and cancer detection. Not surprisingly many improvements related to oil and gas extraction and processing, to environmental measuring and control devices, and to plant operations in very cold weather have been developed in the province. Exploitation of the oil sands is based on locally devised procedures. Climate control experiments have had some measures of success.

Left
Alberta Government
Telephone's (AGT)
telecom circuit board.

Right
Alberta Research
Council experiment -
In-Situ oil sands
recovery process -
Clover Bar



Research funding has always had a high priority for the Alberta government. On a per capita basis, the government funds research and development at approximately three times the level of any other Canadian province; and in total, spends only slightly less than Ontario. In 1982-83, in aggregate, the private and public expenditures in Alberta were over \$539 million - about 11 percent of all such expenditures in Canada. The main sources of funding were: industry 33 percent; the provincial government 38 percent (including 16 percent through the universities); the federal government 20 percent; and others, including the Alberta Heritage Foundation for Medical Research, over 8 percent.

Since the formation of the Alberta Research Council in 1921, the provincial government has led all others in Canada in its commitment to research in general and in the development of new technologies. The original mandate of the Council was to determine more accurately the provincial mineral resources and to investigate possible methods to advance their development. This far-sighted decision resulted in the technology now used in the two operating oil sands plants. Currently Council research is concentrated on oil sands and heavy oils; on coal upgrading; on development of services to industry, including the joint venture research program; and on those frontier areas of science which seem likely to have long-term economic benefit.

TABLE 3.1

RESEARCH AND DEVELOPMENT EXPENDITURES IN ALBERTA AND CANADA (MILLIONS OF DOLLARS)

	Alberta 1981-82	Alberta 1982-83	Canada 1982-83
Expenditures on			
Natural Sciences	456	488	4 591
Social Sciences	46	51	427
Total	501	539	5,018

The Alberta Oil Sands Technology and Research Authority (AOSTRA) was established in 1974 to develop technologies to recover oil from deep (or in situ) oil sands and heavy oil deposits, to develop new methods to improve the economics of surface mining of the oil sands, to develop new approaches to the exploitation of heavy oil deposits, and to improve techniques to recover higher proportions of petroleum from conventional oil fields. The achievements of this agency, particularly with its growing joint venture projects with private industry, have exceeded expectations.

The Office of Coal Research and Technology was created in 1984 to focus on new and improved commercial technologies to enhance the competitiveness of Alberta coals in international markets, to minimize the environmental impact on the production or utilization of coal, and to develop new uses for coals.

The agricultural industry depends on a continuing availability of new technology for viability and growth. The Farming for the Future and other programs of the Alberta Department of Agriculture provide research grants and contracts to universities, public agencies, and private firms, as well as conducting applied research in Departmental facilities. The program has ensured a growing supply of new technology to support agricultural production - in particular new capabilities in food processing, field crop development, and animal and crop pests management.

The Alberta Heritage Foundation for Medical Research was created and endowed by the provincial government in 1979. Its objective is to build a balanced program of medical research by supporting basic and clinical scientists in Alberta hospitals and universities. The Foundation has been a major factor in the formation of a medical research community.

Concern for the environment has been demonstrated by the creation and construction of the Alberta Environmental Centre at Vegreville as well as by other related research activities. The Alberta Research Council manages, on behalf of other government departments and agencies, a land reclamation program, and a weather modification program aimed at hail suppression and rain inducement.

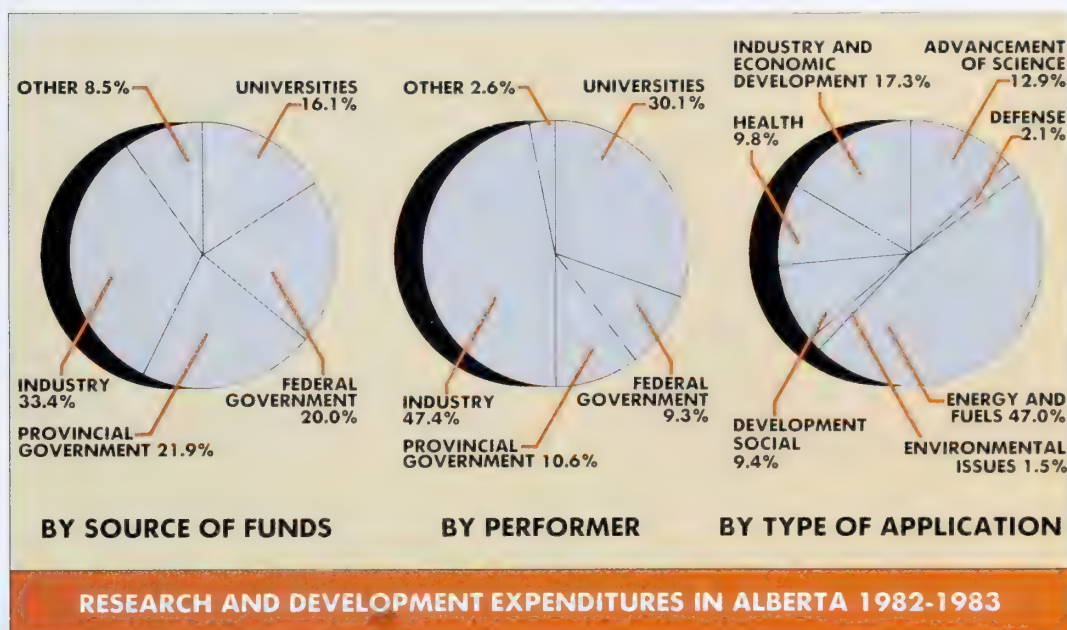
There is an increasingly impressive list of new technological facilities in the province. For example, the Alberta Microelectronics Centre was created to assist industry in all phases of micro-electronic product development and marketing. The Centre for Frontier Engineering Research, created in 1984, is involved in the research and evaluation of materials and fabrication processes primarily related to steel structures for use in cold regions. An Electronic Products Test Centre is being established in the Alberta Research Council facilities to provide testing and certification for Alberta and western Canadian electronic product manufacturers.

Research and Development Parks have been established in Calgary and Edmonton to provide land and facilities for R & D in more concentrated environments.

An impressive list of companies is engaged in major research and development activities. Subjects under study include, for example, hydro carbon

resources extraction and upgrading, telecommunications and other electronic systems, chemicals and metals, and the practical uses of lasers.

Crucial to any technologically intensive industrial strategy is the development of a university and college system to ensure the availability of well trained, scientific, technical, and managerial personnel. The research environment fostered by world class universities and colleges is particularly important for firms relying heavily upon research and development for expansion and growth. Alberta universities are playing an increasingly important role in assisting companies to commercialize academically initiated technology in areas such as electronic systems, laser technology, biotechnology and chemical engineering. Since the research role of universities, colleges and technological institutes is so critical to the advancement of any economy, the Alberta government is giving substantial support to their research facilities and programs.



Source: Planning Secreteriat, Alberta Advanced Education



Energy Resources

Bucket Wheel
Excavator used in oil
sands recovery at
Syncrude, Ft
McMurray.

Alberta has been accurately described as Canada's energy province. Large areas are underlain by thick beds of ancient sedimentary rock which contain deposits of oil, natural gas, bitumen, and coal. In addition, swift rivers flowing to the Arctic Ocean as well as eastward to the Hudson Bay have substantial potential as sources of hydroelectric energy. This section presents details of the development of these important resources.

In recent decades, conventional crude oil and natural gas have been the most significant sources of fossil fuel energy. Coal and the oil sands, however, comprise by far the largest potential sources. Accompanying tables contain information highlighting the extent of Alberta's endowment of these resources.

Remaining established reserves of conventional crude oil in Alberta comprised some 64 per cent of the Canadian total at year end 1983. The decline from the 81 per cent recognized in 1980 occurred because oil reserves for the east coast offshore fields were included in the Canadian total for the first time in

1981. Alberta's remaining established reserves of natural gas comprised 70 per cent of Canadian reserves in 1983.

These resources are of substantial importance to both Alberta and Canada.

Interest is being shown in coal and oil sands reserves because of past increases in international crude oil prices, and because of the probability of not meeting future Canadian energy requirements from domestic conventional petroleum sources. Alberta's coal reserves are not as easily defined as reserves of crude oil and natural gas, but they comprise the largest source of fossil-fuel energy by a wide margin. The development of Alberta oil sands has received world-wide attention. Major commercial oil sands plants to extract oil from the sands began operations in 1967 and 1978, and an expansion of the first plant began in 1983.

In addition to its fossil fuel reserves, Alberta also has a significant reserve of non-depleting hydro energy. The ultimately developable hydroelectric energy potential is estimated to be some 60,000 gigawatt hours a year. The major

TABLE 4.1

**REMAINING
ESTABLISHED
RESERVES OF
FOSSIL FUELS -
ALBERTA -
(ESTIMATED AS AT
YEAR END 1983)**

Fuel	Type	Unit of Measure	Quantity
Coal	Subbituminous	Tonne	$14,800 \times 10^6$
	Bituminous	Tonne	$1,700 \times 10^6$
	- Low - Medium Volatile	Tonne	$1,800 \times 10^6$
Synthetic Crude Oil (developed and undeveloped)		m ³	$3,890 \times 10^6$
Bitumen (developed)		m ³	12×10^6
Conventional Crude Oil		m ³	658×10^6
Ethane		m ³	316×10^6
Natural Gas		m ³	$1,826 \times 10^6$
Liquified Petroleum Gases*		m ³	199×10^6
Pentanes Plus		m ³	113×10^6

* Includes propane and butane.

Source: ERCB Selected Statistics

portion of this potential reserve is contained in the Athabasca, Peace, and Slave Rivers. To date, only about three per cent of the total hydro reserves have been developed, entirely on the Bow and North

Saskatchewan River systems. In 1983 some 13 per cent of Alberta's electrical generating capacity was based on hydro development and generated some 6 per cent of the electric energy required.

TABLE 4.2

ESTIMATED
REMAINING
ULTIMATE
POTENTIAL
RESERVES OF
FOSSIL FUELS -
ALBERTA -
(ESTIMATED AS AT
YEAR END 1983)

Fuel	Type	Unit of Measure	Quantity
Coal	Subbituminous	Tonne	600×10^9
	Bituminous	Tonne	4.4×10^9
	- Low - Medium Volatile	Tonne	200×10^9
Synthetic Crude Oil		m	42.938×10^9
Conventional Crude Oil*		m ³	1.311×10^9
Ethane		m	449×10^9
Natural Gas		m	2.661×10^9
Liquified Petroleum Gases**		m	279×10^9
Pentanes Plus		m	178×10^9

* Includes tertiary recovery

** Includes propane and butane

Source: Alberta Energy Centre Report E18, (RCB Report 54-18)
(RCB Report 54-18, Oil Report 54-13)



Petroleum and Natural Gas

Since the early part of this century the oil and gas industry has been a prime factor in Alberta's economic growth.

The first commercial gas well in Alberta was drilled at Medicine Hat in 1890, and the first commercial natural gas liquids production began in the Turner Valley area in 1914. Heavy crude oil was first commercially extracted near Wainwright in 1925. Important discoveries of heavy oil were made later at Vermilion and Lloydminster. In 1932, a major discovery of light crude oil was made in the Turner Valley gas field.

Turner Valley subsequently developed into a major area of oil and gas production, and Calgary emerged as the principal location for the Canadian petroleum industry. The discovery of oil near Leduc in 1947 launched modern oil and gas development.

The Petroleum and Natural Gas Conservation Board was established in 1938 to enforce conservation measures and eliminate the wasteful flaring of natural gas occurring in the Turner Valley field. Now called the Energy Resources Conservation Board, it is the regulatory body responsible for ensuring that all

energy resources are developed in an orderly, efficient, and safe manner and that environmental standards are met.

The other major regulatory body in the Alberta energy industry is the Alberta Petroleum Marketing Commission. It was established in 1980 to act as an agent for the Crown in the buying and reselling of petroleum, pentanes plus, and natural gas produced in Alberta. The A.P.M.C. is also responsible for administering the pricing system and for determining the Alberta cost of service for pipelines within the province.

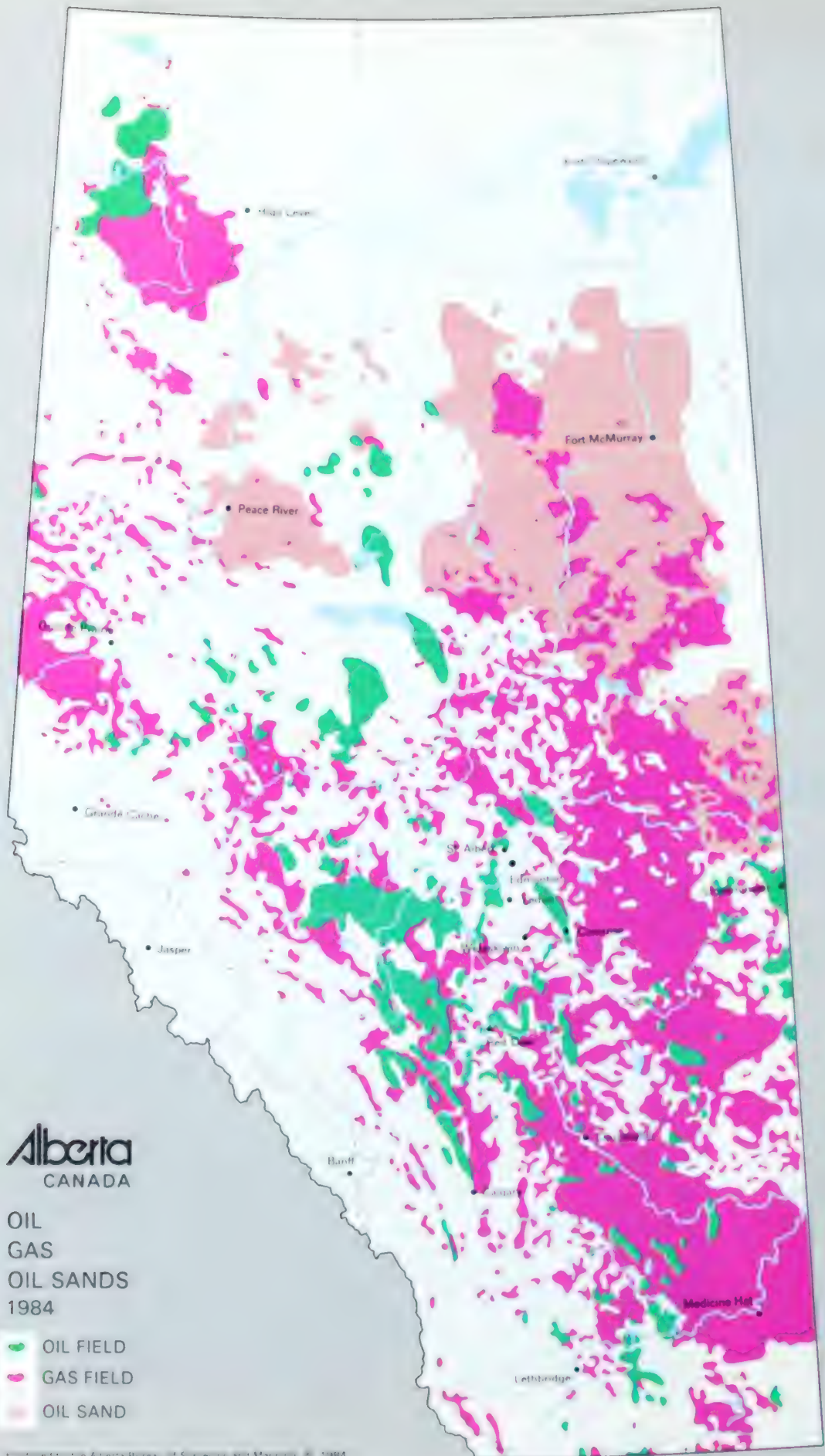
Oil and gas pipelines in Alberta extend to the east, south, and west supplying central Canada, part of British Columbia, and a substantial portion of the U.S. with petroleum liquids and natural gas. The Interprovincial Pipeline was completed in 1950 to transport crude oil from Edmonton to Superior, Wisconsin. It was extended to Sarnia, Ontario in 1953; to Toronto, Ontario in 1957; and to Montreal, Quebec in 1976. The TransCanada Pipeline was completed in 1958 and now supplies gas markets as far east as Montreal. The TransMountain Pipeline and the Westcoast Transmission Pipeline were completed in 1953 and 1957 respectively, to supply oil and gas to the west coast region of Canada.

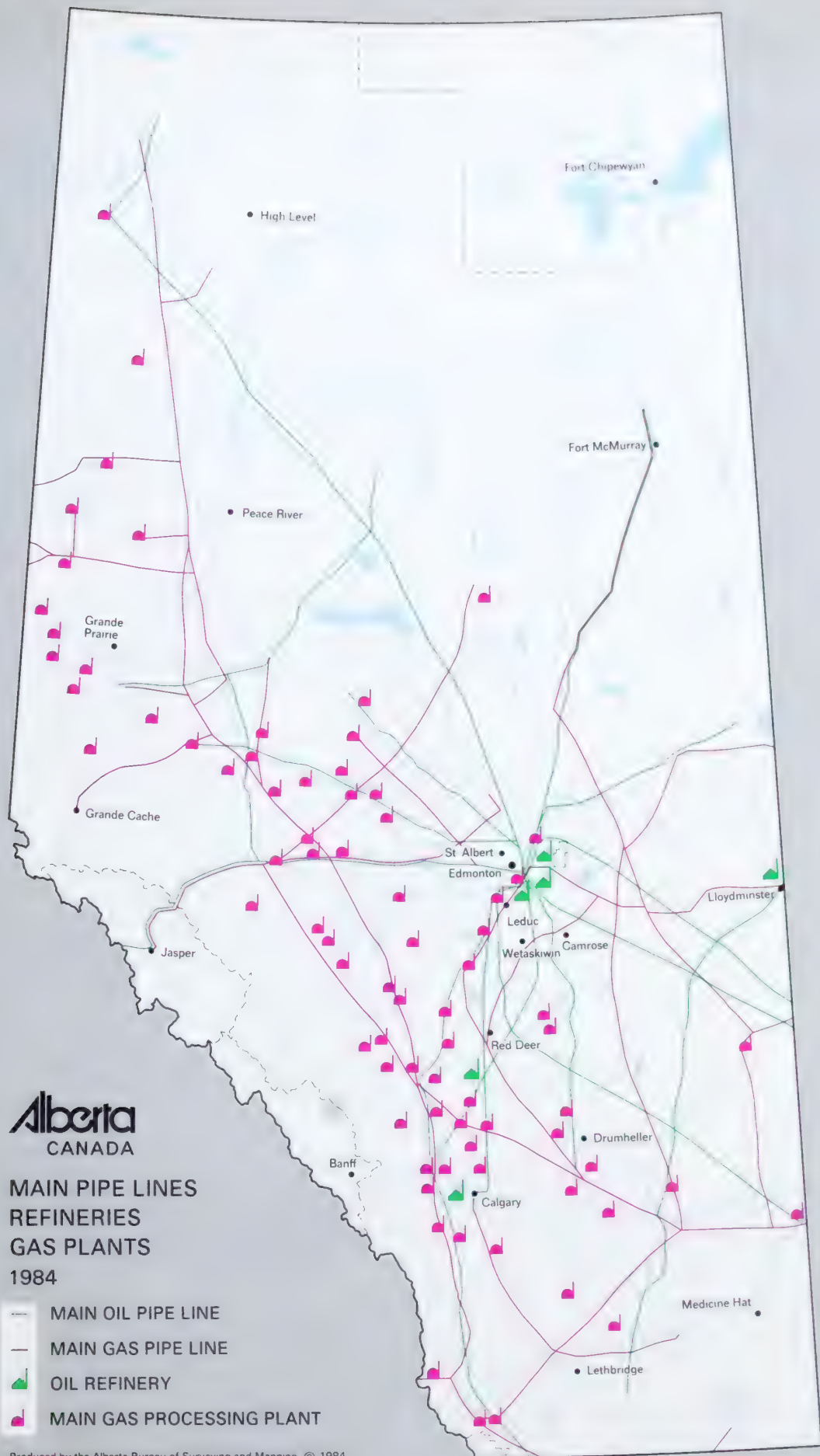
TABLE 4.3

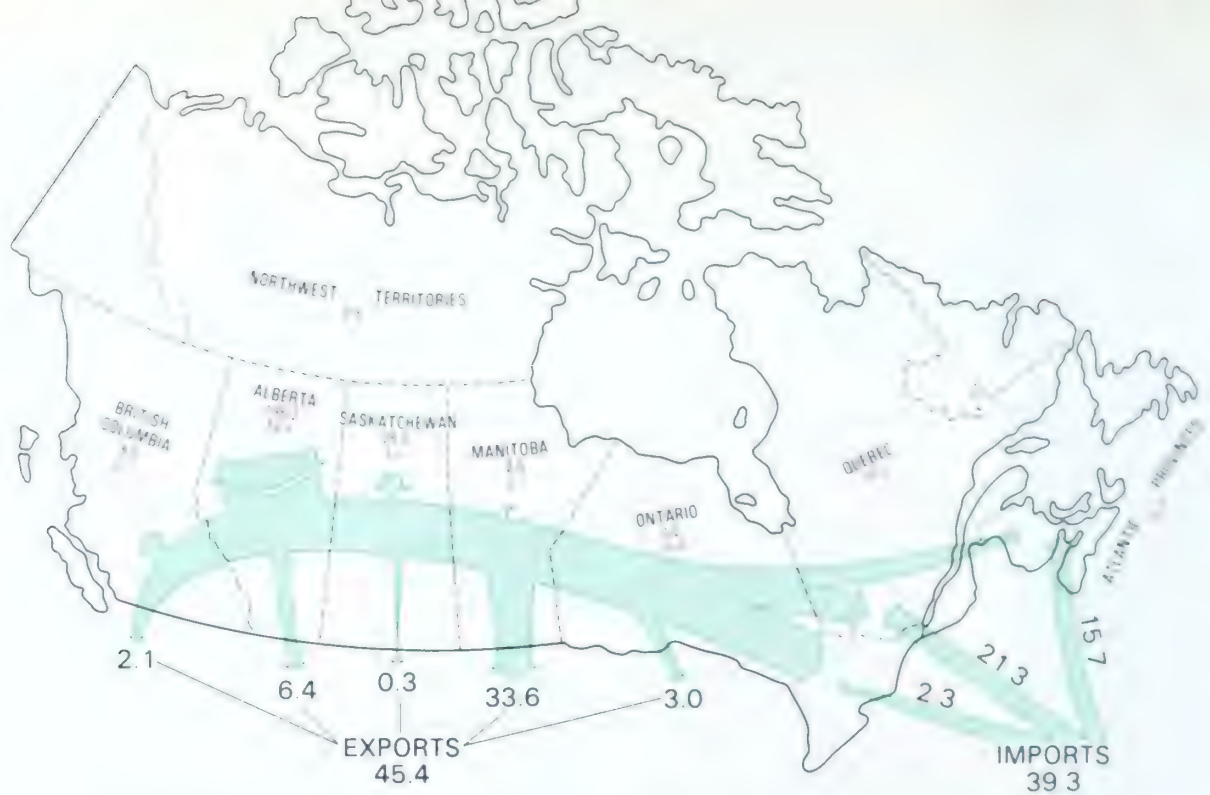
OIL AND GAS WELL DEPTH DRILLED - WELLS COMPLETED AND YEAR END STATUS - ALBERTA - 1971 AND 1976-1983

Depth Drilled (kilometres)	1971	1976	1977	1978	1979	1980	1981	1982	1983
Development	1,132	2,909	2,926	3,348	3,840	4,716	3,598	3,601	3,836
Outpost	87	73	35	60	301	516	482	407	300
Exploration	1,227	1,893	2,289	2,718	2,772	3,187	2,686	1,893	1,517
Total	2,446	4,875	5,250	6,126	6,913	8,419	6,766	5,901	5,653
Well Completions (number)									
Oil	362	552	702	944	1,250	1,606	1,425	1,563	2,242
Gas	691	5,101	2,952	3,090	3,177	3,895	3,056	2,411	1,091
Dry	898	1,296	1,416	1,471	1,284	1,483	1,293	1,099	980
Suspended	53	8	20	13	15	4	11	8	9
Service	21	84	40	55	54	60	49	41	45
Total	2,025	5,041	5,130	5,573	5,780	7,048	5,834	5,122	4,367
Well Status at Year End (number)									
Oil Wells									
Capable of Production	14,065	15,663	16,224	16,871	17,673	18,833	20,072	21,345	23,182
Operated	9,467	11,166	11,592	12,151	12,805	13,312	14,243	15,259	16,694
Gas Wells									
Capable of Production	3,426	9,010	12,529	14,897	17,173	19,546	22,611	25,400	27,125
Operated	2,830	7,753	10,806	12,785	14,760	16,661	18,797	20,611	21,881
Capped	1,801	4,864	6,023	6,686	8,268	10,094	11,593	10,991	10,835

Source: Energy Resources Conservation Board, Alberta Oil and Gas Industry Annual Statistics and Monthly Statistics

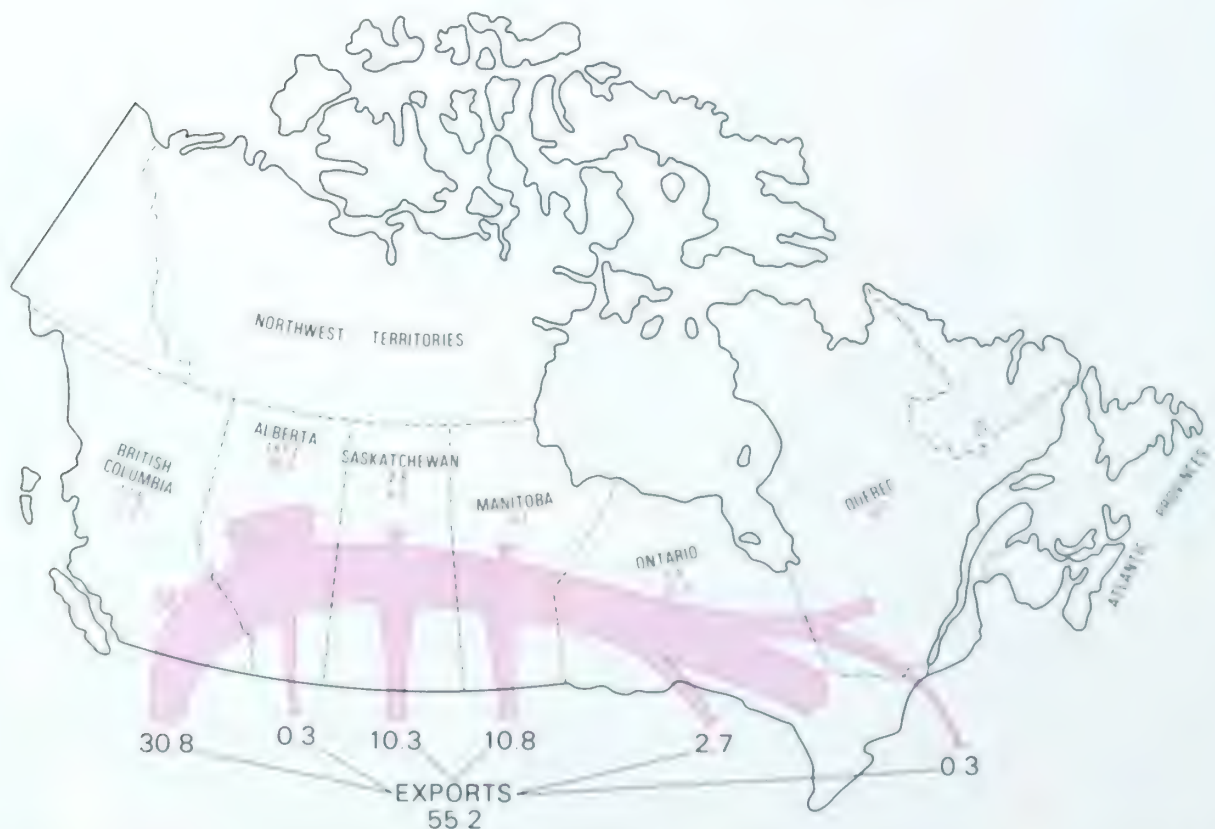






MOVEMENTS OF OIL WITHIN, TO AND FROM CANADA, 1983 CONVENTIONAL AND SYNTHETIC CRUDE OIL, PENTANES PLUS AND EQUIVALENTS

FIGURES IN THOUSANDS OF CUBIC METRES PER DAY
 PRODUCTION 229.9 DOMESTIC CONSUMPTION 226.4



MOVEMENTS OF MARKETABLE NATURAL GAS WITHIN, TO AND FROM CANADA, 1983

FIGURES IN MILLIONS OF CUBIC METRES PER DAY

PRODUCTION 11.4 DOMESTIC CONSUMPTION 10.8

The TransMountain Pipeline was extended in 1955 to supply oil to the Puget Sound area of the northwestern U.S. The Westcoast line transports gas mainly to British Columbia and the northwestern U.S. By 1961, the Alberta Gas Trunk Line Company Limited was also exporting gas south to the northwestern U.S. and California via the Crowsnest Pass and connecting pipelines. The movements of oil and gas within, to, and from Canada are illustrated on the accompanying maps.

Alberta is the major force in Canada's oil and gas industry. In 1983, Alberta supplied 195,200 cubic metres a day, or 85 per cent of Canada's requirements, of crude oil and equivalent (conventional, synthetic and experimental crude oil, condensate and pentanes plus). About 64 per cent of Alberta's 1983 production of crude oil and equivalent was delivered to other Canadian provinces, while the U.S. received 15 per cent. Daily exports by Canada to the U.S. averaged 45,400 cubic metres of crude oil and equivalent, while Canadian imports averaged 39,300 cubic metres per day.

Production of conventional crude oil in 1983 was up slightly from its 1982 level. For the first time since 1969, additions to reserves exceeded production levels. The net increase of 8 million cubic metres brought remaining established reserves to 658 million cubic metres by the end of 1983. Alberta conventional crude oil reserves constitute approximately 65 per cent of Canadian reserves.

Exploration and development activity in 1983 continued their downward trend. Total drilling fell to an 8-year low. Of the 4,367 wells drilled during 1983, exploratory drilling accounted for 1,371 wells and development drilling accounted for the remaining 2,996 wells. These were 48 per cent and 32 per cent lower, respectively, than the exploratory and development well completions in 1980 when drilling activity peaked. This overall decline masks quite different trends within the oil and gas sectors. Both exploratory and development drilling for oil have increased whereas both have fallen for natural gas. The decline in natural gas drilling has been largely due to uncertainties in the U.S. export market.

Alberta production of marketable natural gas in 1983 was 157 million cubic metres per day, 88 per cent of total Canadian production. Approximately 40 per cent of Alberta's gas was sold to other provinces and 30 per cent was exported to the United States.

Remaining established reserves of marketable natural gas in Alberta at the end of 1983 were estimated to be 1,899 million cubic metres. This was 69 per cent of Canadian reserves.

At present there are almost 500 gas processing plants in Alberta where the gas is stripped of its by-products and upgraded to pipeline quality. Additional processing capacity is being provided by the expansion of existing facilities and by the construction of new plants.

The sale of crude oil, natural gas and related products totalled approximately 97 per cent of the \$22.2 billion value of minerals produced in 1983. Alberta government revenue from mineral resources for the years 1973/74 through 1983/84 is shown in an accompanying table.

TABLE 4.4

ANNUAL
PRODUCTION OF
LIQUID
HYDROCARBONS
AND NATURAL
GAS, BY TYPES -
ALBERTA - 1967-
1983 (CUBIC
METRES)

	Crude Oil * '000	Synthetic Crude Oil '000	Condensate '000	Pentanes Plus '000	Propane * '000	Butanes* '000	Natural Gas * '000 000
1967	36 694	72	121	4 540	2 033	1 319	35 368
1968	39 991	910	127	4 934	2 303	1 507	40 437
1969	44 402	1 603	107	5 786	2 637	1 655	47 275
1970	51 769	1 920	112	6 657	3 200	2 083	54 441
1971	56 780	2 469	121	7 071	3 672	2 400	59 592
1972	67 508	2 963	145	9 270	4 624	3 055	67 967
1973	83 013	2 906	159	9 427	5 166	3 361	73 591
1974	79 108	2 654	119	9 012	5 083	3 372	73 354
1975	67 512	2 474	114	8 443	5 359	3 502	74 468
1976	60 908	2 779	115	7 421	5 240	3 435	75 237
1977	60 514	2 611	122	7 344	5 342	3 500	78 545
1978	60 015	3 239	122	6 561	5 051	3 211	77 494
1979	68 516	5 329	134	6 472	5 542	3 471	82 314
1980	63 201	7 410	111	5 891	5 294	3 249	77 358
1981	56 979	7 199	95	5 652	5 192	3 126	76 376
1982	54 384	8 239	104	5 530	5 235	3 117	78 522
1983	55 271	10 682	108	5 175	4 677	3 025	74 762

* net production

and Natural Gas Production Cat. No. 26-006

TABLE 4.5

CANADIAN
NATURAL GAS
PRODUCTION* - BY
PROVINCE AND
TERRITORY
SELECTED YEARS -
1947-1983
(MILLIONS OF
CUBIC METRES)

	N.W.T.	British Columbia	Alberta	Saskat- chewan	Western Canada	Eastern Canada	Canada
1947-1956	38	14	28 089	1 168	29 309	2 679	31 987
1957-1966	145	31 249	181 345	15 628	228 367	4 346	232 713
1967	18	6 732	35 368	1 750	43 868	404	44 272
1968	20	7 681	40 437	1 928	50 066	346	50 412
1969	19	8 908	47 275	1 974	58 177	322	58 499
1970	25	9 561	54 441	2 271	66 299	475	66 774
1971	60	9 960	59 592	2 461	72 073	466	72 539
1972	451	12 413	67 967	2 204	83 036	358	83 395
1973	1 094	13 460	73 591	2 161	90 305	278	90 583
1974	966	11 625	73 354	2 019	87 964	221	88 185
1975	934	11 277	74 468	1 960	88 640	314	88 954
1976	1 026	10 829	75 237	1 902	88 995	143	89 139
1977	856	11 061	78 545	1 669	92 131	244	92 375
1978	619	9 898	77 494	1 554	89 655	355	90 011
1979	626	11 384	82 314	1 559	95 883	390	96 274
1980	402	9 056	77 358	1 591	88 407	448	88 858
1981	397	8 418	76 376	1 498	86 690	426	87 116
1982	261	7 879	78 522	1 620	88 282	442	88 724
1983	216	7 830	74 762	1 636	84 444	462	84 907
Total	8,174	199,328	1,356,067	48,714	-	-	-

* Raw natural gas production less raw and processed injected gas

Source: Canadian Petroleum Association, Statistical Handbook, Statistics Canada, The Crude Petroleum and Natural Gas Industry, Cat. No. 26-28

TABLE 4.6

CANADIAN CRUDE OIL PRODUCTION* -BY PROVINCE AND TERRITORY - SELECTED YEARS - 1947-1983 (THOUSANDS OF CUBIC METRES)

	N.W.T.	B.C.	Alberta **	Sask.	Man.	Western Canada	Eastern Canada	Canada
1947-56	484	24	92,675	7,430	2,044	102,657	511	104,181
1957-66	862	1,062	248,292	100,929	8,336	359,481	1,726	370,119
1967	113	3,125	36,694	14,712	7,713	62,357	199	55,731
1968	120	3,522	39,991	14,609	888	59,130	184	59,412
1969	127	4,024	44,402	13,896	986	63,435	186	63,622
1970	135	4,028	51,769	14,227	940	71,099	168	71,265
1971	149	3,997	56,780	14,063	891	75,880	154	76,034
1972	141	3,787	67,508	13,768	835	86,040	141	86,181
1973	153	3,367	83,013	13,626	808	100,966	130	101,097
1974	159	2,995	79,108	11,726	755	94,742	118	94,860
1975	160	2,269	67,512	9,379	702	80,021	113	80,134
1976	142	2,366	60,908	8,886	633	72,936	101	73,037
1977	138	2,199	60,514	9,763	631	73,245	99	73,344
1978	146	2,004	60,015	9,625	598	72,388	96	72,483
1979	150	2,140	68,516	9,372	583	80,761	93	80,853
1980	161	2,002	63,201	9,331	564	75,258	94	75,352
1981	173	2,032	56,979	7,393	543	67,120	90	67,210
1982	173	2,077	54,384	8,104	582	65,320	86	65,406
1983 E	169	2,078	55,271	9,475	738	67,731	84	67,815

* Excludes experimental and synthetic crude oil.

** Includes some condensate prior to 1951.

E - Estimate

Canada: The Crude Petroleum and Natural Gas Industry, Cat. No. 26-2B

TABLE 4.7

PRODUCTION OF CRUDE OIL BY FIELD - ALBERTA - SELECTED YEARS - 1914-1983 (THOUSANDS OF CUBIC METRES)

FIELD	1914-76	1977	1978	1979	1980	1981	1982	1983
Acheson	11,376	604	605	860	775	737	697	676
Bantry	4,273	297	283	270	239	248	200	247
Bonnie Glen	42,510	2,636	2,658	4,738	4,257	4,167	3,747	3,840
Carson Creek North	10,838	1,087	1,086	1,307	1,213	1,074	1,190	1,180
Clive	3,668	410	428	457	411	410	341	337
Fenn Big Valley	26,698	1,276	1,353	2,585	2,587	2,740	2,424	2,465
Garrington	2,349	162	137	113	116	143	189	230
Gilbey	5,037	265	268	242	229	213	195	192
Golden Spike	24,029	1,179	1,106	761	418	324	233	171
Goose River	4,021	299	342	289	283	261	300	240
Harmattan East	7,073	508	474	480	393	298	291	339
Harmattan Elkton	6,035	380	338	329	323	316	294	313
Innisfail	7,341	432	448	649	560	449	303	275
Joarcam	12,681	336	313	305	259	218	218	299
Joffre	10,742	238	231	230	210	185	173	172
Judy Creek	39,648	3,284	3,251	3,291	2,901	2,082	1,595	1,256
Kaybob	10,108	616	638	814	669	545	501	569
Kaybob South	5,275	576	589	713	654	561	606	592
Leduc-Woodbend	54,218	797	880	662	569	530	457	433
Medicine River	4,991	446	455	467	491	490	473	516
Mitsue	21,548	2,310	2,294	2,510	2,423	2,226	2,126	1,729
Nipisi	19,624	2,048	2,120	2,337	1,901	1,947	1,816	1,874
Pembina	137,934	4,732	4,673	4,933	4,544	4,305	4,462	4,679
Rainbow	39,251	4,326	4,204	4,440	4,223	3,702	3,583	3,364
Rainbow South	4,802	637	576	591	554	408	382	358

TABLE 4.7

CONTINUED

Field	1914 - 76	1977	1978	1979	1980	1981	1982	1983
Red Earth	2 733	296	270	268	267	237	244	252
Redwater	94 935	4 203	4 295	5 120	4 596	2 875	2 039	1 599
Simonette	3 926	342	327	209	168	144	158	132
Snipe Lake	5 673	429	353	317	270	241	224	204
Stettler	5 753	167	179	186	182	180	162	156
Sturgeon Lake South	12 824	896	854	922	823	718	766	725
Sundre	3 798	189	187	174	166	164	166	160
Swan Hills	67 616	5 540	4 799	4 377	4 218	3 276	3 182	2 976
Swan Hills South	30 368	3 213	3 355	3 253	3 218	2 303	1 838	1 489
Turner Valley	20 120	190	184	187	182	175	180	183
Virginia Hills	13 715	966	816	682	728	634	546	713
Virgo	4 068	215	203	202	191	164	190	173
Wainwright	5 353	443	448	429	394	393	379	420
Westerose	10 092	635	647	1 033	883	877	800	975
Willesden Green	10 423	784	807	840	786	709	637	609
Wizard Lake	27 824	2 017	2 033	2 948	2 688	2 586	2 367	2 318
Zama	7 421	453	439	430	375	319	368	391
Other Fields & Areas	98 064	9 618	10 351	11 913	12 039	12 396	13 148	15 491
Annual Production		60,477	60,097	68,463	63,176	56,972	54,382	55,314
Cumulative Production	940,775	1,001,252	1,061,349	1,129,812	1,192,988	1,249,960	1,304,342	1,359,656*

* Includes Adjustments from Previous Years

TABLE 4.8ESTIMATED
REMAINING
ESTABLISHED
RESERVES OF
CONVENTIONAL
CRUDE OIL, BY
PROVINCE 1978-
1983 (MILLIONS
OF CUBIC METRES)

	1978	1979	1980	1981	1982	1983
British Columbia	22.8	27.6	25.9	25.9	24.2	24.3
Alberta	794.5	760.6	719.6	696.0	649.4	657.8
Saskatchewan	117.2	117.7	117.8	117.0	109.7	114.3
Manitoba	6.3	5.7	5.2	5.0	8.2	12.5
N.W.T.	10.6	21.2	21.0	20.9	20.7	30.5
Eastern Canada	1.5	1.5	1.4	1.0	0.8	0.9
East Coast Offshore				175.0	175.0	175.0
Total	952.9	934.3	890.9	1,040.8	988.0	1,015.3

TABLE 4.9ESTIMATED
REMAINING
ESTABLISHED
RESERVES OF
MARKETABLE
NATURAL GAS, BY
PROVINCE - 1978-
1983 (MILLIONS
OF CUBIC METRES)

	1978	1979	1980	1981	1982	1983
British Columbia	218.4	207.4	208.7	222.3	220.6	222.2
Alberta	1 730.9	1 783.1	1 812.1	1 864.8	1 924.6	1 898.7
Saskatchewan	35.3	35.4	33.7	32.6	28.3	27.6
N.W.T.	509.4	598.0	579.8	576.3	604.8	605.1
Eastern Canada	9.4	8.9	8.3	8.8	9.0	12.8
Total	2,322.2	2,496.1	2,491.9	2,562.9	2,787.3	2,766.4

TABLE 4.10

**PETROLEUM
INDUSTRY
EXPENDITURES -
ALBERTA AND
CANADA -
SELECTED YEARS -
1947-1983
(MILLIONS OF
DOLLARS)**

	1947-75	1976	1977	1978	1979	1980	1981	1982	1983*
Alberta									
Exploration	3,424.1	402.0	618.1	994.8	1,377.2	2,073.9	1,896.0	1,401.4	1,105.0
Development	2,235.5	277.2	351.2	477.4	679.2	1,063.3	1,083.2	942.5	870.0
Land	3,071.9	255.5	679.9	740.5	1,144.7	1,224.5	721.3	465.6	569.0
Production Facilities	1,918.8	413.4	366.2	485.9	654.4	1,036.3	1,024.1	971.9	755.0
Production Costs	3,309.3	615.1	707.3	852.3	1,092.3	1,304.7	1,640.7	1,967.3	1,869.0
Gas Plants	1,377.4	155.0	143.8	165.9	204.7	241.1	310.9	493.7	170.0
Royalties	4,689.3	1,974.1	2,398.9	3,054.9	3,623.3	4,248.3	4,496.7	5,098.1	5,750.0
Other	1,295.0	384.9	353.0	435.3	591.6	800.2	193.8	193.0	200.0
Total	21,321.4	4,477.2	5,618.4	7,207.0	9,367.4	11,992.2	11,366.7	11,533.6	11,288.0
Canada									
Exploration	6,472.4	832.1	1,137.4	1,739.5	2,358.2	3,420.9	3,457.7	3,233.5	3,233.8
Development	2,889.2	277.2	351.2	477.4	898.0	1,308.8	1,248.0	1,194.1	1,321.1
Land	3,983.2	344.0	860.1	1,014.8	1,438.0	1,546.9	872.4	568.4	768.7
Production Facilities	2,442.8	454.6	416.7	605.4	797.7	1,363.0	1,217.7	1,235.2	1,096.7
Production Costs	4,330.7	729.6	833.8	1,003.7	1,318.8	1,612.8	1,950.8	2,317.4	2,221.9
Gas Plants	1,550.5	170.7	155.5	218.8	301.9	311.6	347.1	522.8	183.0
Royalties	5,706.5	2,202.7	2,673.8	3,388.2	4,026.7	4,708.2	4,911.3	5,645.3	6,421.2
Other	1,540.0	482.5	479.1	624.0	637.5	878.1	257.3	246.5	217.3
Total	28,915.5	5,493.4	6,907.6	9,071.8	11,776.8	15,150.2	14,262.2	14,963.2	15,473.7

* Estimate

Source: Statistics Canada - The Crude Petroleum and Natural Gas Industry Cat. No. 26-213, 1983
Estimate from Canadian Petroleum Association

TABLE 4.11

**ALBERTA
GOVERNMENT
REVENUE FROM
MINERAL
RESOURCES -
FISCAL YEARS
-1973/74-1983/84
(THOUSANDS OF
DOLLARS)**

	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84*
Coal											
Fees, Rental & Bonus	3,484	3,447	4,193	3,471	3,840	4,165	1,495	4,249	4,408	4,387	3,567
Royalty	676	710	888	6,794	15,198	19,646	7,543	8,263	11,920	13,950	10,786
Petroleum & Natural Gas											
Fees, Rental & Bonus	133,092	133,221	184,602	265,594	800,985	782,543	1,121,994	843,073	647,921	421,851	566,476
Royalty	372,214	1,188,016	1,503,628	1,815,964	2,304,006	3,076,603	3,409,776	3,872,107	4,134,277	4,213,210	4,577,190
Oil Sands											
Fees, Rental & Royalty	9,704	16,089	19,927	23,909	28,929	36,267	51,254	229,390	234,550	371,815	310,333
Mineral Tax	69,075	45,356	54,082	76,319	76,452	96,828	99,949	145,796	134,826	155,899	159,953
Miscellaneous Mining and Administrative Revenue											
	309	385	397	614	671	365	504	525	2,628	2,864	2,096
Landman Licence Fees											
	11	-	5	5	6	13	10	15	39	34	32
Total Applied Revenue	588,565	1,387,224	1,767,721	2,192,671	3,230,093	4,016,430	4,692,525	5,103,418	5,170,569	5,184,010	5,630,433
Less Incentive Credits	10,128	15,251	33,360	49,243	75,160	114,049	98,782	148,476	156,204	156,504	111,813
Total Cash Revenue	578,437	1,371,973	1,734,361	2,143,428	3,154,933	3,902,381	4,593,743	4,954,942	5,014,365	5,027,506	5,518,620

* unaudited

Source: Public Accounts

Oil Sands

Oil sands deposits underlie 60,000 square kilometres of northern and eastern Alberta. The importance and potential of these relatively untapped oil reserves have increased dramatically in recent years because of decreasing conventional crude oil supplies, increasing world petroleum prices and the desire of both the federal and provincial governments to lessen Canadian dependence on oil imports. More sophisticated recovery techniques have made this oil source technologically feasible to exploit.

The four major deposits —Athabasca, Cold Lake, Wabasca and Peace River — together hold an estimated 198 billion cubic metres of bitumen in place. Remaining established reserves of synthetic crude oil obtainable from these resources amount to about 3.9 billion cubic metres.

Crude bitumen deposits also are known to occur in carbonate rocks which underlie the Alberta oil sands. In-place reserves have been estimated at 50 million cubic metres for the Grosmont Formation in these accumulations.

The Athabasca is the largest of the oil sands deposits, with bitumen reserves estimated at 153 billion cubic metres in place. Parts of this deposit can be surface-mined, as the overburden coverage is only 120 metres thick. Elsewhere in this deposit, and in the other three deposits, the overburden is much thicker and recovery is possible using only underground or "in situ" techniques. As the bitumen may range from a viscous heavy oil to a solid, the recovery process requires several stages. Very heavy gravity and extremely high viscosity make bitumen much less able to flow than conventional crude oil.

The bitumen deposits are mined with bucket-wheel excavators or with giant draglines. The sand and crude bitumen are then separated using a hot-water flotation process developed by the Alberta Research Council. The sands are exposed to steam, producing a thick slurry which is dropped into hot water. As the oil and sand separate, the sand sinks and the oil can be skimmed off. The resulting raw bitumen is upgraded by removing sulphur and nitrogen, and either by adding hydrogen or removing carbon. The end-product of this process is a high-grade synthetic crude oil suitable for refining.

The synthetic crude yields generous amounts of aromatics used in the production of phenol, styrene, polyesters, surfactants and dye-stuffs.

The two older oil sands plants currently operating in the Athabasca deposit are essentially similar, although Suncor uses electrically powered bucket-wheel excavators to mine the sands while Syncrude utilizes enormous draglines.

Suncor opened in 1967, a pioneer in commercial oil sands production. After overcoming some technological problems in its first two years of operation, by 1983 this plant attained a daily average production rate of about 6,400 cubic metres of synthetic crude oil. The first expansion of this plant began in late 1983.

Syncrude began operating in 1978, and has steadily increased production rates ever since. By the end of 1983, oil production averaged about 17,300 cubic metres per day, with design capacity of 21,000 cubic metres expected to be reached by 1986. This plant has been the site of innovative techniques: the use of the giant draglines, the installation of facilities to ensure optimal separation of bitumen and sands, as well as the installation and operation of the largest fluid coking facilities in the world. The Alberta government, through Alberta Oil Sands Equity, has a share of 16.7 per cent in this project.

During 1983 and 1984, several commercial scale in situ projects were announced for the Alberta oil sands. These included Amoco Elk Point, BP Petro Canada Wolf Lake, Esso Cold Lake, Shell Peace River, and Dome Lindbergh. The Husky Heavy Oil Upgrader at Lloydminster also began construction. This project will eventually produce about 3,300 cubic metres of synthetic oil per day using Alberta feedstocks.

As well, more than 30 experimental in situ recovery schemes are scattered throughout all four oil sands deposits. In these projects heat is applied to reduce the viscosity of the bitumen; the deposit is then injected with a stimulant such as steam, hot water, air or a caustic substance.

Coal

The coal industry underwent a decline in the 1950s, a decline which began to reverse in the early 1960s. This recovery continued to the end of the 1970s, when the world coal industry again entered a slump in response to reduced economic growth in most industrialized western countries. Structural change and increased conservation of energy in general also combined to alter the demand for coal.

The Alberta metallurgical coal industry is highly dependent on exports to Japanese steel producers while its thermal coal sector has been boosted by replacement of natural gas with coal in the province's major electric utilities. In addition, large eastern utilities notably Ontario Hydro, have begun to supplement their supplies with Alberta coal. The coal sector now ranks as one of the largest extractive industries in the province.

Coal industry productivity has improved through the use of large equipment and through the shift away from many small operations to fewer, and larger more efficient mines.

Coal-bearing formations underlie approximately 300,000 square kilometres of Alberta in three distinct regions — the Plains, Foothills and Mountain. The accompanying map illustrates the general pattern of coal distribution. Coal in the Foothills and Mountain regions has a higher calorific value and less moisture, making it a higher quality fuel. Alberta coal is a clean-burning fuel, as it has a

very low sulphur content.

The Plains Region of eastern Alberta contains an estimated 15.1 billion tonnes of coal, the majority of which is subbituminous coal suitable for thermal-electric generation. Lignite, which has a greater moisture content and lower calorific value than subbituminous coal, is present in smaller amounts. Recently, interest has been generated in the deeper coals requiring underground mining, which make up nearly half of the Plains' reserves. Coal in the Foothills is generally high-volatile bituminous thermal. The majority of the 1.59 billion tonnes in reserves can be surface-mined.

Mountain coals range from semi-anthracite to high-volatile bituminous, although most are low-to medium-volatile bituminous suitable for coking and for the production of steel. Recoverable reserves in this region total 1.69 billion tonnes, of which about 70 per cent will require underground mining. As only the flat-lying parts of these reserves can be mined using conventional technology, a recovery method will have to be devised for the thick and steeply-dipping reserves which are often folded and faulted. Most mining in the Mountain region is currently done by the open-pit, shovel and truck system. Production from the Mountain and Foothills regions is upgraded in coal-preparation plants, which yield about two-thirds clean coal.

The cost of strip-mining the shallow parts of flat-lying coal seams of the Plains region is low, since the cover is mainly

Coal Mining Plant at Grande Cache





MOVEMENTS OF COAL WITHIN, TO AND FROM CANADA, 1983

FIGURES IN MILLIONS OF TONNES PER YEAR




Source: Statistics Canada

Revised: September 1984



Alberta
CANADA

COAL 1984

PLAINS REGION

-  LIGNITE (Less than 19 300 kJ/kg)
-  SUB-BITUMINOUS (19 300 - 23 300 kJ/kg)
-  HIGH VOLATILE BITUMINOUS (23 300 - 30 200 kJ/kg)

FOOTHILLS REGION

-  HIGH VOLATILE BITUMINOUS (23 300 - 30 200 kJ/kg)
-  MEDIUM AND LOW VOLATILE BITUMINOUS (25 600 - 33 700 kJ/kg)

MOUNTAIN REGION

-  MEDIUM AND LOW VOLATILE BITUMINOUS (25 600 - 33 700 kJ/kg)

One kilojoule (kJ) per kilogram (kg) approximately equals 0.43 Btu per pound



UNDERGROUND MINE



SURFACE MINE

Produced by the Alberta Bureau of Surveying and Mapping © 1984



TABLE 4.12

REMAINING
ESTABLISHED
RESERVES OF COAL
IN ALBERTA - 1981
(BILLION TONNES)

Rank	Region	Mineability	In-Place Resources	Reserves
Low- and Medium-Volatile Bituminous	Mountain	Surface	1.10	0.51
		Underground	5.50	1.10
			6.60	1.61
High-Volatile Bituminous	Mountain	Surface	0.08	0.03
		Underground	0.85	0.05
	Foothills	Surface	1.70	1.40
		Underground	0.71	0.19
	Plains	Surface	0.01	0.00
		Underground	0.75	0.19
			4.10	1.86
Subbituminous	Plains	Surface	12.00	7.10
		Underground	28.00	7.70
			40.00	14.80
Lignite	Plains	Surface	0.15	0.08
		Underground	0.35	0.04
			0.50	0.12
Total *			52.0	18.0

* Figures do not add due to rounding.

Source: 1983, Energy Canada.

TABLE 4.13

DISPOSITION OF
ALBERTA COAL
1971 and 1977-
1983 (THOUSANDS
OF TONNES)

Year	Sub-bituminous Sales to:			Bituminous Sales to:				Total Value of Sales	
	Alberta	Other Provinces	Total	Alberta	Other*	U.S.	Other**	Total	\$ '000
1971	3,881	126	4,007	2	75	5	3,113	3,195	42,418
1977	7,223	447	7,670	175	26	-	4,051	4,252	210,408
1978	7,781	465	8,246	140	631	14	4,402	5,187	256,905
1979	9,226	181	9,407	100	1,630	7	3,355	5,092	238,185
1980	10,249	176	10,425	432	1,751	-	5,279	7,462	302,210
1981	11,144	77	11,221	591	1,881	-	4,139	6,611	325,750
1982	12,713	36	12,749	561	1,498	4	5,308	7,071	392,800
1983	13,980	88	14,068	505	1,418	-	5,566	6,989	462,400

* Consists almost entirely of shipments of high volatile bituminous coal to Ontario Hydro.

** Consists mainly of shipments to Japan, but also includes shipments to Brazil, Germany, S. Korea, India, Taiwan, Chile, Mexico and Argentina at various times.

Source: 1983, Energy Canada, *Alberta Coal Sales and Shipments to Other Provinces and Foreign Countries*, Ottawa, 1983, p. 10.

Canada's Mineral Production - Cat. No. 26-202

glacial tills and soft sediments. Reclamation of such areas is usually not expensive. Most of the current production of Plains region coal is burned "as mined" in mine-site electric-generation stations.

The open-pit mines of the Mountain and Foothills regions require drilling and blasting of rock. The cost of mining, including reclamation, is considerably greater than in the Plains region, where mining is by dragline.

The Energy Resources Conservation Board has estimated the total remaining established reserves of coal at 18.3 billion tonnes, and ultimate potential reserves at 804.4 billion tonnes. Deliveries have increased in recent years, and currently total about 21.1 million tonnes per year. In 1983, Alberta used 14.5 million tonnes or

69 per cent of the volume of coal sold. 1.5 million tonnes (7 per cent) were shipped to other provinces and 5.1 million tonnes of bituminous coal went to offshore areas.

Many of the large Plains coal fields may be dedicated to electric-power generation. Some of the electricity generated from coal could be used in railway electrification and for further development of urban light-rail transit systems, thus freeing significant quantities of oil for other uses. Certain deposits could be mined economically to provide feedstock for large synthetic natural gas plants, or for other uses such as the manufacture of liquid fuels, or to provide heat for the recovery of heavy oils and bitumen from the deep oil sands deposits of the province.

Electric Power

Throughout the world the availability of electrical energy at reasonable cost is an important factor in industrial development. Alberta is fortunate because of its hydroelectric potential and abundance of coal and natural gas.

Alberta is the fifth largest producer of electricity in Canada. The province's installed electrical generating capacity at the end of 1983 was almost 5,900 megawatts of which 64 per cent was coal, 22 per cent natural gas, 14 per cent hydro, and less than one per cent fuel oil. Over the past 10 years the fuel sources for electrical generation have shifted away from natural gas and hydro towards coal. Whereas in 1973 natural gas and hydro produced 46 per cent of the electricity generated in Alberta, by 1983 they accounted for only 13 per cent. Coal produced almost all of the remaining electricity throughout the period.

Much of the province's subbituminous coal reserves is surface-mineable at low cost and is reasonably close to the major electric energy load centres. Although gas is more costly than coal, the price differential in the past was offset by the lower capital cost of gas-fired electricity generating plants.

Hydroelectric power is developed along the Bow River System west of Calgary and along the North Saskatchewan River system adjacent to the foothills of central Alberta. Although the development of hydro sites can require a substantial amount of capital, the absence of a fuel cost makes certain hydro

projects competitive with thermal generation.

In 1983, approximately 960,000 customers were provided with electricity in Alberta - 740,000 residential customers, 110,000 commercial, 90,000 farms, and 20,000 industrial. The growth in annual electric energy consumption is shown in an accompanying table. Average revenue rose from 1.52 to 5.14 cents per kilowatt-hour over the period 1973 to 1983.

Power plants and major consumption centres are connected by an extensive network of transmission lines. These lines extend from Medicine Hat in the southeast to areas beyond Rainbow Lake in northwestern Alberta, within 80 km of the Northwest Territories. Isolated plants, which are not connected to the main transmission system, serve a few communities such as Jasper.

The principal municipal electric utilities in the province are those in Edmonton, Calgary, Lethbridge, Medicine Hat, and Red Deer. Privately owned utilities supply most of the smaller communities and farms as well as bulk power to the cities of Calgary, Lethbridge, Medicine Hat, and Red Deer. Net capacity and net energy generated in 1983 and net generation by type of power source are shown in the accompanying tables.

Future generating stations that have been approved for construction are a 363 megawatt unit at the Keephills Power Plant in 1984, two 363-megawatt units at the new Sheerness power Plant in 1986 and 1987 and two 384-megawatt units at the new Genesee Power Plant in 1988 and 1989.

TABLE 4.14

SUPPLY AND DISPOSAL OF ELECTRIC ENERGY - ALBERTA 1978-1982 (GIGAWATT HOURS)

	1978	1979	1980	1981	1982
SUPPLY					
Production	19,161.9	21,668.6	23,451.4	25,569.8	27,112.4
Imports	1.9	1.9	1.9	2.1	2.4
Inter-regional transfers	-52.4	-287.8	-281.0	-92.5	256.4
Total Supply	19,111.4	21,382.8	23,172.3	25,479.4	27,371.1
DISPOSAL					
Manufacturing	3,328.7	3,578.9	3,899.5	5,181.7	5,134.2
Mining	3,095.7	3,929.5	4,288.5	4,426.6	5,050.7
Urban transit	9.1	8.6	8.0	17.3	27.6
Pipelines	449.8	590.5	592.1	503.9	477.6
Public administration	-	-	-	228.5	199.4
Street lighting	262.5	260.3	276.9	288.1	296.5
Commercial/institutional	5,518.0	6,133.5	6,756.0	7,129.3	7,785.2
Residential	3,724.1	4,078.3	4,397.2	4,540.3	5,072.9
Agriculture	999.2	1,080.0	1,114.4	1,130.0	1,274.7
Unallocated energy	1,724.2	1,723.2	1,839.7	2,033.4	2,052.4
Total Disposal	19,111.4	21,382.8	23,172.3	25,479.4	27,371.1

Source: Statistics Canada - Electric Power Statistics, Cat. No. 57-202



TABLE 4.15

**ELECTRICAL
GENERATION PER
CAPITA, NUMBER
OF CUSTOMERS,
TOTAL REVENUE,
AND AVERAGE
REVENUE PER kw.h
- ALBERTA
-1973-1983**

	Generation per Capita (kw.h)	Number of Customers ('000)	Total Revenue (\$ '000 000)	Average Revenue per kw.h (cents)
1973	7 595	567	174.3	1 52
1974	7 952	595	203.8	1 65
1975	7 981	624	255.4	1 97
1976	8 131	662	331.8	2 39
1977	8 783	704	403.1	2 73
1978	9 072	756	497.2	3 08
1979	9 934	802	573.3	3 20
1980	10 238	853	665.8	3 46
1981	10 481	898	840.1	4 05
1982	10 518	915	1053.5	4 68
1983	11 163	960	1220.7	5 14

Source: ERCB - Alberta Electric Industry Annual Statistics 1983

TABLE 4.16

**NET CAPACITY
AND NET
GENERATION OF
POWER PLANTS —
ALBERTA — 1983**

	Net Installed Capacity MW	Net Generation GW.h
Interconnected System		
Transalta Utilities Corporation		
Hydro	800.0	1,473.1
Thermal	2,908.0	18,067.6
Alberta Power Limited		
Thermal	975.9	5,128.3
Edmonton Power		
Thermal	1,035.5	1,130.1
City Of Medicine Hat		
Thermal	136.5	510.9
City of Calgary		
Thermal	3.6	.
Total Interconnected System	5,859.5	26,310.1
Isolated Plants		
Hydro	1.4	6.7
Thermal	23.2	40.9
Total	24.6	47.6
Total Alberta Utilities	5884.1	26,357.8
Industrial On-Site Plants	654.7	1,704.5

Source: ERCB - Alberta Electric Industry Annual Statistics 1983

TABLE 4.17

**ENERGY
CONSUMPTION IN
ALBERTA* -
1980-1983
(PETAJOULES)**

	1980	1981	1982	1983
Transportation	253	253	245	223
Industrial	238	226	232	196
Residential	125	125	160	151
Commercial	119	123	140	127
Agriculture	57	54	52	67
Total	792	781	829	764

* Energy use only. Not weather-corrected. Does not include electrical conversion and transmission losses, feedstock and non-fuel uses.

Source: ERCB - Alberta Electric Industry Annual Statistics 1983

Energy Conservation

Alberta is very well-endowed with energy resources. In 1938 the province established the Oil and Gas Conservation Board (now the Energy Resources Conservation Board) to regulate energy resource development and ensure that these resources would be produced in the most efficient and economic manner. The Board continues to monitor the activity of Alberta's energy production industry as a means of conserving energy resources in the field at the point of production.

There have been rapid increases in energy prices to Alberta consumers in recent years after decades of steady or declining real energy prices. The result is that energy consumers are now becoming more interested in reducing their energy use and costs.

Although energy use fluctuates on an annual basis, it can be seen from the table below that the transportation and industrial sectors are the largest energy consumers in the provincial economy, each with roughly 30% of total energy use. Residential and commercial sectors (including schools, hospitals and public administration as well as businesses) each account for somewhat less than 20% of total energy use. Energy used in agricultural production comprises roughly 7% of the provincial total.

The provincial government has established information and awareness programs to assist energy users in evaluating their technical options for reducing energy costs. Major programs are directed to homeowners and residential contractors, school teachers and students, and industrial energy users, to promote awareness of good energy management practices.

Programs of technical advice and or financial assistance for energy conservation on farms, in school buildings and in government buildings have also been established.

The Industrial Energy Conservation Program is of special interest because it is directed to the largest energy-consuming sector in the province. A key element of this program is the provision, on request, of a free analysis of an industrial or commercial establishment's energy consumption.

The service focuses on identifying opportunities for energy savings in commercial, industrial and institutional facilities.

The energy audit service has been available since 1980, and delivers over 200 energy audits a year on request to Alberta industry, business and institutional facilities. Results of these audits suggest typical energy cost savings of 20% can be achieved, mostly by adopting inexpensive energy management measures.

There is no doubt that as energy prices continue to rise in Alberta, businesses will become even more interested in efficient management of their energy use.

TABLE 4.18

**CAPACITY OF
POWER PLANTS BY
TYPE & ENERGY
RESOURCE & BY
UTILITY OPERATOR
- ALBERTA - 1983
(MEGAWATTS)**

	Net Installed Capacity	Hydro	Steam Turbine		Gas Turbine	Internal Combustion	
			Coal	Gas	Gas	Gas	Fuel Oil
Transalta Utilities Corporation	3,708.0	800.0	2,908.0	-	-	-	-
Edmonton Power	1,035.5	-	-	977.5	58.0	-	-
Alberta Power Limited	1,000.5	1.4	865.0	-	103.1	22.6	8.4
City of Medicine Hat	136.5	-	-	55.5	81.0	-	-
City of Calgary	3.6	-	-	-	-	-	3.6
Total	5,884.1	801.4	3,773.0	1,033.0	242.1	22.6	12.0

Source: ERCB - Alberta Electric Energy Annual Statistics 1983



Transportation

Distance from ocean ports, distance from large population concentrations, relatively large internal distances between commodity consumption or production centres, and a relatively sparse population, all combine to make Alberta industries and individuals extremely conscious of the importance of transportation to economic development and to personal convenience. Transportation costs and time are often the difference between profitability and business failure. Alberta producers have to compete with others who have readier physical access to markets, who have lower transportation costs and who can make speedier deliveries.

At the turn of the century when the province was formed, railways provided the only means for the movement of the bulk commodities — grain, livestock, forestry products, and coal — on which early economic development depended. For shorter distances, horses and horse-drawn vehicles provided the only motive power and conveyances.

By the 1940's automobiles, trucks, and primitive aeroplanes were displacing equine power for the short-haul movement of persons and small-load commodities. Telephones began to replace mail as a means of communication.

By 1980 transportation systems were revolutionized both locally and world wide. Railways and ocean transport have been largely relegated to the long-distance transportation of bulk commodities, especially in the North American context. Today, Alberta's transportation systems are much different than they were decades ago. Trucks,

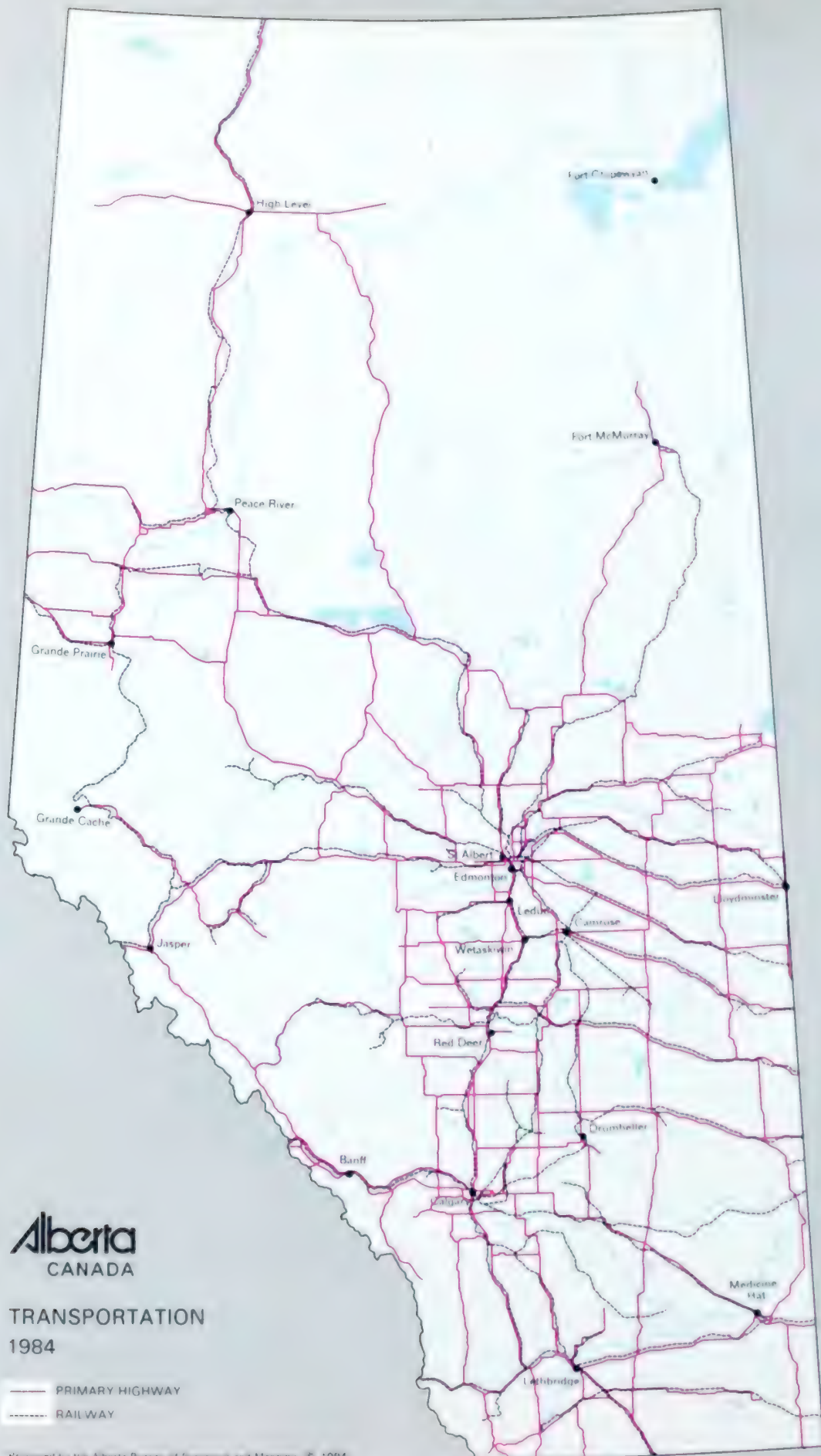
automobiles and buses provide fast, convenient and low-cost transportation for goods and people over an excellent government-owned and operated road system. Railways, which own and maintain their own infrastructure, carry large volumes of bulk commodities by unit trains, an increasing volume of high-value merchandise freight by container and piggy-back, and a relatively small but growing number of passengers by intercity and transcontinental trains.

Pipelines carry significant volumes of certain products more efficiently to continental markets. The speed and relatively low cost of aeroplane travel have made local, continental and world wide destinations readily and financially accessible to vast numbers of persons and industrial firms.

Improved refrigeration techniques have made possible the movement and distribution of enormous volumes of perishable goods such as fruits and vegetables. The construction of highways and bridges have evolved to standards sufficient to cope with the immensely increased demands of modern usage and needs.

All these developments imply reductions in real and relative transportation costs and in much higher efficiency. Certain types and instances of development have almost universal impact: better engineering of power plants and vehicles; cheaper and better quality fuels; pipelining techniques; the evolution of "container" traffic, for example, with inherent cost-saving opportunities such as double stacking. Other facets of cost reductions are within

The testing of Double-Stack container rail cars sponsored by the Government of Alberta



Processed by the Alberta Bureau of Surveying and Mapping © 1984

the control of local authorities.

In this latter field the Alberta government is doing all in its jurisdiction to assist in the lessening or removal of natural or man-made handicaps affecting Alberta producers. An excellent high quality road and bridges system has been constructed linking all parts of the province. The initial impetus for rail extension to relatively remote areas has been supported and financed. To meet the needs of growing traffic demands, focus has now turned to the huge investments being made by railways to expand westbound capacity.

Air strips have been provided for use in mineral, forestry, and tourist development. Financial assistance is being provided for the improvement of ocean ports through which products must pass. Significant improvements to intercity and transcontinental passenger rail services are being studied. Practical, financial, and moral support is given in negotiations to obtain the best possible railway freight rates.

The cumulative effect of all these measures is apparent in the ever higher volumes of raw and manufactured Alberta products reaching continental and world markets.

Highways

The Alberta economy has always been very closely linked with developments in transportation systems. Growth in interprovincial and intraprovincial highways has played a significant part in economic development and in transforming the life styles of Albertans.

There are currently over 15,000 kilometres of paved rural roads and highways. A continuing highways upgrading program is being undertaken by both the provincial and municipal governments. Excellent arterial roads and highways link similar main highways in the adjacent provinces of British Columbia and Saskatchewan, and south into the United States. Both the Trans-Canada Highway (through Calgary) and the Yellowhead Highway (through Edmonton) function as major 'coast to coast' routes.

Over the past two decades the development of roads and highways has played a major role in changing the growth pattern of Alberta's smaller centres. Certain towns have developed into larger service centres; others are declining

in functionality and importance. Easy access to city stores and markets is often offset by the even easier access to the expanded services being offered by the larger towns. Freight trucks offer stiff competition to the railways in terms of both cost and convenience.

It is the responsibility of the Alberta Department of Transportation to construct and maintain the primary highway systems. Local municipal governments are responsible for the construction and maintenance of district roads connecting rural areas with service centres and main highways. The province provides roads where there is no local government.

The provincial government contributes financially to the costs of secondary roads in rural areas and of approved arterial thoroughfares in urban areas, although administrative jurisdiction and operation remain with the municipal governments.

The development of resources in more remote areas of the province has been encouraged by the construction of highways to centres such as Fort McMurray, Grande Cache and the Cadomin and Luscar coalfields. Forestry roads crisscross the 60 per cent of the province which is covered by forest, providing easy access to timber and other resources.

Economic and social developments within the province have a dynamic effect on the transportation demand pattern. Alberta's high level of highway service is not only due to the opening of new routes; considerable effort is required to maintain and upgrade the existing system to keep abreast of changing demands.

By 1984 there were over 150,000 kilometres of rural highways and roads in Alberta. This total broke down into the following categories: paved (15,236 kilometres), oil treated (10,435 kilometres), gravelled (102,677 kilometres), and graded (23,114 kilometres).

In 1984 there were over 2,000,000 registered motor vehicles. Of this total there were some 430,000 trucks in operation, and some 1,300,000 passenger cars.

Large and small scale truck transport operators are assisted by a government policy of freedom in rate setting, and in ease of entry into business. The Motor Transport Board is willing to consider deregulating certain currently regulated

ALBERTA IN NORTH AMERICA

DISTANCES IN KILOMETRES AND AVERAGE DRIVING TIMES FROM PRINCIPAL CENTRES IN NORTH AMERICA TO THE ALBERTA BORDER. (AVERAGE DRIVING TIMES ARE IN BRACKETS)

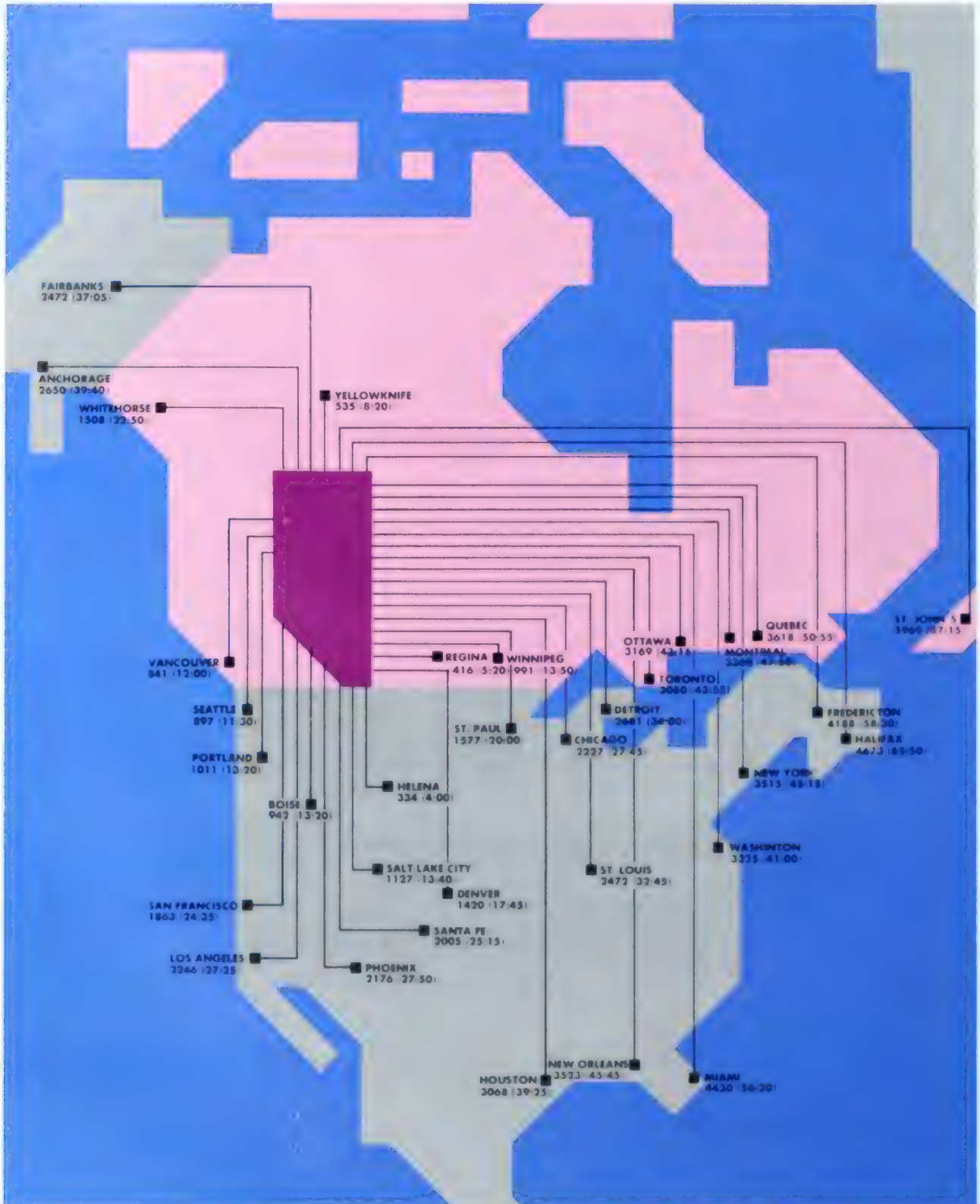


TABLE 5.1

HIGHWAYS AND
ROADWAYS,
GRADED,
GRAVELLED, OIL
TREATED AND
PAVED - RURAL
AREAS - 1972-1983
(KILOMETRES)

	Graded	Gravelled	Oil Treated	Paved			Total	Total
				2-lane	4-lane	6-lane		
Primary Highways								
1972	-	2 493	-	7 876	621	42	8 539	11,032
1973	-	2 247	-	8 105	639	48	8 792	11,038
1974	-	2 073	-	8 325	647	48	9 020	11,093
1975	-	689	1 300	8 513	597	42	9 154	11,141
1976	-	969	1 320	8 552	626	42	9 220	11,508
1977	-	1 273	1 126	8 698	626	42	9 366	11,765
1978	-	1 338	1 362	9 015	618	42	9 675	12,375
1979	-	1 265	1 586	9 190	613	42	9 845	12,696
1980	-	1 344	1 488	9 507	613	43	10 163	12,995
1981	-	1 409	1 281	9 748	613	43	10 404	13,094
1982	-	1 367	1 103	10 165	599	40	10 804	13,274
1983	-	1 314	976	10 279	703	40	11 022	13,312
Approach Roads								
1972	-	95	-	190	-	-	190	285
1973	-	93	-	201	-	-	201	295
1974	-	89	-	214	-	-	214	303
1975	-	37	42	225	-	-	225	304
1976	-	37	43	229	-	-	229	309
1977	-	34	48	219	-	-	219	301
1978	-	49	43	225	-	-	225	317
1979	-	50	42	225	-	-	225	317
1980	-	38	42	240	-	-	240	320
1981	-	30	50	240	-	-	240	320
1982	-	29	44	263	-	-	263	336
1983	-	20	33	302	-	-	302	355
Park, Secondary and Local Roads								
1972	27,282	95,967	3,394	1,001	-	-	1,001	127,643
1973	27,138	94,885	5,256	1,151	-	-	1,151	128,430
1974	26,987	93,968	6,909	1,252	-	-	1,252	129,116
1975	26,644	92,352	9,527	1,128	-	-	1,128	129,663
1976	27,373	93,435	10,274	1,666	-	-	1,666	132,748
1977	25,412	94,806	11,009	2,286	-	-	2,286	133,513
1978	24,781	92,265	11,330	2,351	-	-	2,351	130,727
1979	24,294	96,605	11,666	2,598	-	-	2,598	135,163
1980	24,718	96,658	11,567	2,528	-	-	2,528	135,471
1981	24,606	97,726	11,685	3,432	-	-	3,432	137,448
1982	23,265	99,971	9,785	3,487	-	-	3,487	136,508
1983	23,115	101,336	9,449	3,897	-	-	3,897	137,797
Total								
1972	27,282	98,554	3,394	9,067	621	42	9,730	138,960
1973	27,138	97,225	5,256	9,456	639	48	10,148	139,763
1974	26,987	96,129	6,909	9,791	647	48	10,486	140,511
1975	26,644	93,078	10,869	9,867	597	42	10,507	141,099
1976	27,373	94,441	11,637	10,446	626	42	11,114	144,465
1977	25,412	96,113	12,183	11,203	626	42	11,871	145,579
1978	24,781	93,652	12,735	11,591	618	42	12,251	143,419

TABLE 5.1

CONTINUED

	Graded	Gravelled	Oil Treated	Paved			Total	Total
				2-lane	4-lane	6-lane		
1979	24,294	97,920	13,294	12,013	613	43	12,667	148,176
1980	24,718	98,040	13,097	12,275	613	43	12,931	148,785
1981	24,606	99,165	13,016	13,420	613	43	14,076	150,862
1982	23,265	101,367	10,932	13,915	599	40	14,554	150,118
1983	23,115	102,670	10,458	14,478	703	40	15,221	151,464



TABLE 5.2

**MOTOR VEHICLE
REGISTRATIONS BY
TYPE - ALBERTA -
1967-1981
(NUMBER)**

	Passenger Car	Truck	Bus	Rental Vehicle	Taxi	School Bus	Trailer	Motor- Cycle	Other*	Total
1967	442,144	177,610	935	1,893	1,158	3,497	56,368	11,615	4,663	669,883
1968	466,458	188,678	972	2,458	1,227	3,578	65,850	12,899	3,088	745,208
1969	482,375	197,893	967	2,739	1,287	3,682	75,163	14,208	3,208	781,522
1970	503,925	205,739	1,041	3,549	1,361	3,744	85,970	16,370	3,328	825,027
1971	525,524	214,120	1,062	3,485	1,411	3,764	95,595	19,393	3,376	867,730
1972	552,854	227,008	1,092	3,639	1,420	3,789	106,090	23,593	3,275	922,760
1973	582,167	246,440	1,199	4,644	1,588	3,831	117,029	24,528	3,504	984,930
1974	620,480	273,548	1,294	5,773	1,678	3,872	132,454	27,028	3,893	1,070,020
1975	690,330	318,932	1,558	8,199	1,788	4,032	148,181	32,269	4,238	1,209,527
1976	704,743	319,193	1,698	7,202	1,794	4,020	154,362	29,621	5,790	1,228,423
1977	760,861	335,568	1,993	7,537	1,749	4,173	171,584	31,586	6,975	1,319,026
1978	855,419	370,600	2,154	6,991	2,005	4,206	184,196	33,861	7,848	1,467,280
1979	949,233	405,679	2,360	8,622	2,429	4,206	204,277	40,644	8,780	1,626,230
1980	1,026,502	438,890	2,440	11,546	2,826	4,488	214,836	44,722	10,885	1,757,135
1981	1,126,990	458,881	2,773	13,357	3,208	4,632	233,227	52,987	10,969	1,906,964
1982	1,200,010	469,570	2,861	13,184	3,478	4,732	239,997	55,639	11,394	2,000,865
1983	1,246,026	460,613	3,129	10,451	3,648	4,797	247,019	59,900	11,429	2,047,012
1984	1,277,502	438,799	3,199	9,156	3,518	4,824	247,629	59,456	11,179	2,055,262

* Other includes pole trailers and dealers

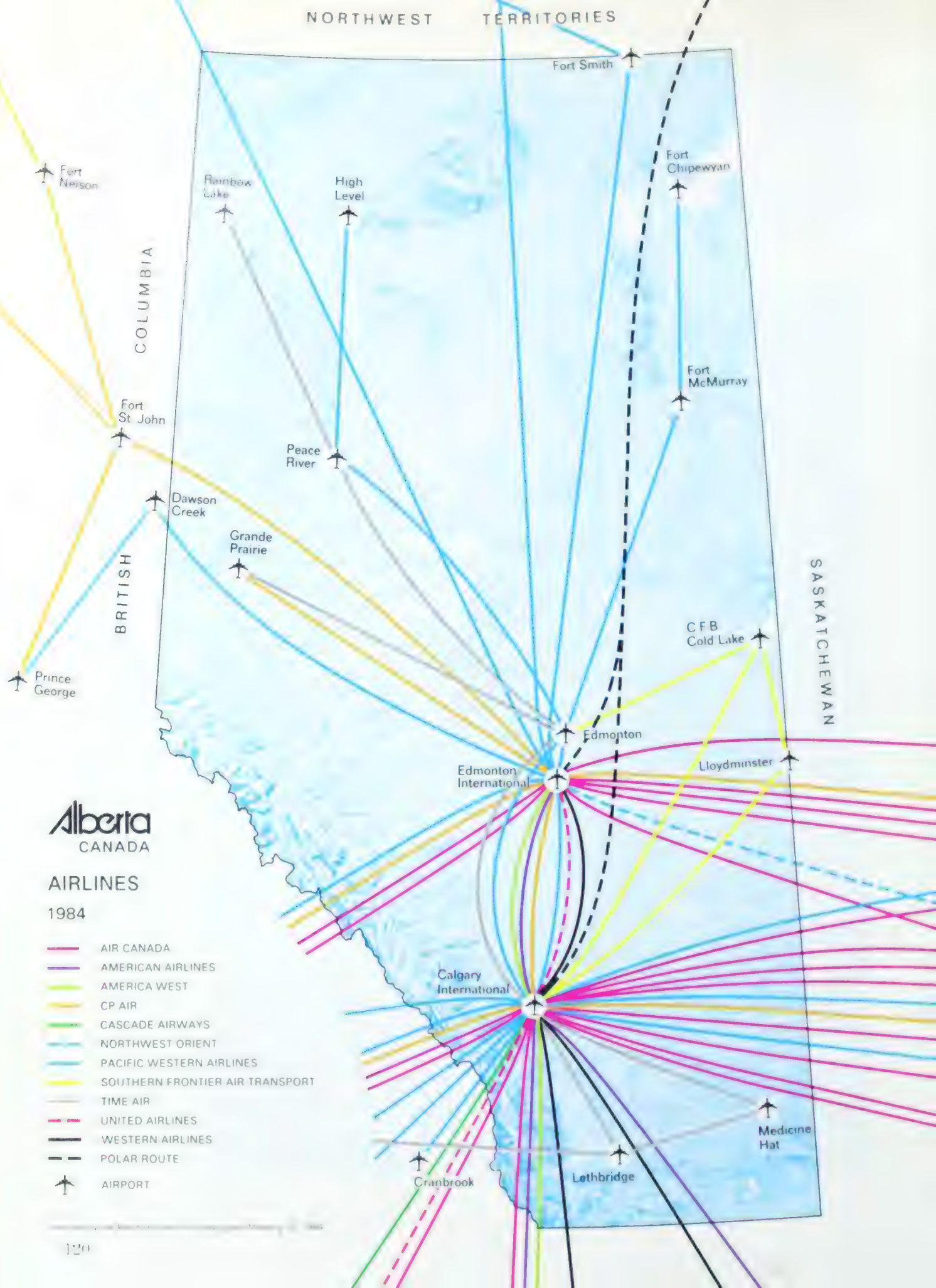
aspects of the industry. This allows competitive forces to develop, support and maintain commercial trucking services.

Private commercial trucking accounts for over 25 per cent of total cargo flow. Intermodal transportation facilities are used extensively by both shippers and truckers on long haul and import/export travel lanes.

The advanced highway infrastructure permits the trucking industry to take full advantage of new equipment technology and of maximum utilization of equipment. Highway axle weight control is of benefit to all carriers through simplification and standardization, and because of reduced deterioration of the highway network.

Several privately-owned bus companies provide scheduled passenger transportation and parcel express

delivery. Their services link the cities together and provide access to most smaller communities. Approximately two million passengers are carried annually. Greyhound Lines serve the Calgary-Edmonton corridor; the Trans-Canada route through Calgary; the Yellowhead route through Edmonton; the Calgary-Lethbridge corridor; and several other routes located for the most part to the south of Calgary. Coachways System operates an extensive network of services between Edmonton and points in central and northern Alberta. Major routes are Edmonton-Grande Prairie; Edmonton-Fort McMurray; and Edmonton-Cold Lake. Pacific Western Transportation operates "Red Arrow" luxury bus services on two routes: Calgary-Edmonton and Edmonton-Fort McMurray.



Alberta
CANADA

AIRLINES

1984

- AIR CANADA
- AMERICAN AIRLINES
- AMERICA WEST
- CP AIR
- CASCADE AIRWAYS
- NORTHWEST ORIENT
- PACIFIC WESTERN AIRLINES
- SOUTHERN FRONTIER AIR TRANSPORT
- TIME AIR
- UNITED AIRLINES
- WESTERN AIRLINES
- - - POLAR ROUTE
- ✈ AIRPORT

Aviation

Aviation Services have played a major role in the development of Alberta's economy. Supporting this role in Alberta are approximately 80 licensed airports, 28 heliports and 8 seaplane bases in addition to over 800 unlicensed airports. Calgary and Edmonton International airports accommodate both domestic and international services and provide facilities for pre-clearing U.S. customs.

Air Services in Alberta have also evolved in response to changing demand.

In 1982 after a decade in which passenger enplanements and deplanements at Alberta's three major airports (Edmonton International, Edmonton Municipal and Calgary) increased fourfold, passenger traffic declined. In that year total passenger enplanements and deplanements at the three airports was just over 6.9 million, down from 7.8 million in 1981 and 7.6 million in 1980. Further passenger decreases were experienced in 1983.

Freight traffic fared better during this period as total deplaned and enplaned freight at the three airports increased from 55.5 million kilograms in 1980 to 56.8 in 1982.

Notwithstanding the negative impacts of the recession on airline traffic volumes, Alberta continues to enjoy a high level of air service. Air Canada and CP Air provide transcontinental service using both wide body and narrow body jet aircraft. CP Air also provides regional

service into B.C. and the Yukon. Pacific Western Airlines (PWA) provides jet service throughout Western Canada, the Arctic and as far east as Toronto. A cornerstone of its operations is the high frequency Airbus service connecting Edmonton and Calgary. Commuter type services which connect Edmonton and Calgary to regional centres throughout Alberta and southern B.C. are provided by Time Air, Southern Frontier Air Transport and Wapiti Aviation.

Service to the United States has increased, with new jet services initiated by United and American, and turbo prop service initiated by Cascade. Air Canada, Western, and Northwest Orient remain active in the transborder markets. Service to Europe has also improved with Lufthansa adding direct service to Germany via the polar route. This supplements the polar route services that are operated by Air Canada and CP Air.

Wardair, Canada's largest charter air firm, provides both domestic and international charter services. PWA, CP Air and Air Canada are also active in the charter market.

Transcontinental dedicated freighter services are provided both by Air Canada using jet aircraft and by Northwest Territorial Airways using turbo-prop aircraft.

Alberta is favored with a large number of commercial air carriers that provide charter and specialized services. Corporate aviation also plays an important

TABLE 5.3

**LANDINGS PLUS
TAKE-OFFS,
ITINERANT AND
LOCAL FLIGHTS,
SELECTED
AIRPORTS -
ALBERTA -1971
and 1977-1982
(NUMBER)**

	1971	1977	1978	1979	1980	1981	1982
Calgary International	180,009	208,170	196,576	225,619	235,422	233,170	198,467
Edmonton Municipal	175,825	213,060	193,593	201,036	194,883	185,963	144,221
Edmonton International	84,812	91,850	87,079	100,194	99,913	94,937	80,885
Footner Lake	9,399	9,878	15,674	11,839	17,087	19,103	20,344
Fort Chipewyan	-	5,639	5,982	8,910	5,637	5,524	5,607
Fort McMurray	9,484	52,441	47,835	55,395	46,895	62,843	60,753
Grande Prairie	38,496	45,540	57,122	68,018	76,574	71,820	46,793
Lethbridge	50,540	64,792	53,300	56,741	50,283	57,180	45,980
Medicine Hat	13,885	34,466	27,379	25,411	26,252	31,584	21,444
Peace River	16,553	29,452	30,264	26,400	23,871	28,262	26,612
Rainbow Lake	3,444	803	590	862	3,251	2,385	2,515
Red Deer	43,858	57,112	49,078	51,714	57,812	55,979	43,183
Springbank	142,709	201,608	207,275	241,149	227,702	231,736	170,218
Vermilion	1,366	16,107	13,613	10,252	9,913	12,440	736
Whitecourt	3,509	10,872	16,365	18,230	22,993	20,620	19,270

(1) These statistics show the total of landings and take-offs of local and itinerant flights. A local movement is one in which the aircraft remains at all times within the airport tower control zone. An itinerant movement is one in which the aircraft enters or leaves the airport tower control zone.

Source: Transport Canada, Aviation Statistics Centre "Aircraft Movement Statistics"

TABLE 5.4

NUMBER OF
PASSENGERS
ENPLANED PLUS
DEPLANED
SCHEDULED
AIRLINE FLIGHTS -
EDMONTON AND
CALGARY
AIRPORTS - 1964-
1982
THOUSANDS

	Edmonton International	Edmonton Municipal	Calgary International
1964	384	96	485
1965	457	128	585
1966	563	189	672
1967	472	225	808
1968	577	247	915
1969	538	298	1 060
1970	585	367	1 203
1971	645	387	1 262
1972	719	456	1 415
1973	885	580	1 833
1974	1 138	635	2 079
1975	1 366	667	2 218
1976	1 443	875	2 397
1977	1 582	696	2 593
1978	1 757	763	2 926
1979	2 312	853	3 585
1980	2 339	973	4 031
1981	2 312	947	4 254
1982	2 033	789	3 797

Source: Canadian Council of Ministers of the Environment, *Environment Canada*, 1983

TABLE 5.5

DEPLANED PLUS
ENPLANED
AIRMAIL AND
CARGO FREIGHT -
CALGARY AND
EDMONTON
AIRPORTS - 1964-
1982 (THOUSANDS
OF KILOGRAMS)

	Edmonton International		Edmonton Municipal		Calgary International	
	Mail	Cargo	Mail	Cargo	Mail	Cargo
1964	2 320	2 126	625	2 197	1 489	2 081
1965	2 486	3 197	702	3 288	1 611	2 493
1966	1 757	3 850	787	2 509	1 531	3 631
1967	1 830	4 490	800	2 834	1 938	3 967
1968	2 177	6 132	888	2 748	2 004	5 226
1969	2 767	5 909	922	3 223	2 791	6 631
1970	2 338	6 859	870	3 543	2 222	7 935
1971	2 606	8 374	875	3 890	2 598	9 140
1972	2 532	8 354	968	4 658	2 580	9 575
1973	3 352	11 506	1 017	4 399	3 039	12 398
1974	4 169	15 966	621	3 378	3 423	13 835
1975	4 936	17 248	274	3 052	3 089	14 039
1976	5 243	18 331	211	2 149	3 917	16 751
1977	6 013	20 092	223	2 266	4 377	17 714
1978	6 181	24 807	215	1 428	4 581	19 450
1979	7 097	24 024	250	1 701	5 424	23 407
1980	6 968	28 004	196	1 950	6 302	23 126
1981	6 941	24 972	148	1 787	6 981	26 004
1982	6 969	24 952	173	2 139	8 101	27 590

Source: Canadian Council of Ministers of the Environment, *Environment Canada*, 1983

role. Many companies have developed extensive expertise in satisfying the unique needs of the oil and gas industry.

The future of the aviation industry in Alberta appears promising. There are signs that traffic is stabilizing; recent changes in the regulatory structure have given the air carriers greater flexibility to respond to market conditions, and both

PWA and Time Air, which are headquartered in Alberta, were extremely successful in 1983 in attracting new equity capital. The industry therefore appears well positioned to expand as the economic conditions improve. As the economy of Alberta matures and its base diversifies, the role of air services will likely assume even greater importance.



Edmonton, Canadian
National Railway
Marshal Yard

Railways

The completion of the Canadian Pacific Railway in 1885 opened Alberta for major economic development. Since that time, the railways have been an essential element of economic growth.

Resource development necessitated the establishment of other regional rail lines. The Northern Alberta Railway (NAR), recently purchased by the CNR, services the Peace River block and has a line northeast to Fort McMurray from Edmonton. A freight-only line runs to Dawson Creek, British Columbia.

The Alberta Resources Railway, owned by the Alberta government, was completed in 1969. It was conceived primarily to accelerate the development of the natural resources of coking coal, gypsum, pulp wood, timber, petroleum, natural gas, and sulphur in the area lying north of Hinton and south of the Peace River block. To date, mainly coal mining has been assisted — up to 3 million tonnes being moved annually from Grande Cache through the Neptune coal terminal at Vancouver to Japanese and other overseas markets.

A railway line linking the NAR with Hay River and the Pine Point lead-zinc

mines of the Northwest territories, was completed in 1969 by the CNR with federal government financial assistance. It is an important factor in the economic development of the Mackenzie Valley and the Arctic Coast. Large volumes of northbound equipment and material pass through the railhead at Hay River for shipment by barge along the Mackenzie River system.

VIA Rail Canada Inc. utilizes CNR and CPR trackage in Alberta to provide three rail passenger services: The daily transcontinental on the CPR route through Calgary; a Winnipeg-Saskatoon-Edmonton-Jasper-Prince Rupert train on the CNR (daily east of Edmonton; tri-weekly west); and a twice-daily Calgary-Edmonton service on the CPR. The transcontinental carries approximately 130,000 passengers annually through Alberta, while the Winnipeg-Prince Rupert train is expected to handle roughly 70,000 annually. The federal government is committed to restoring the Jasper-Vancouver link over the CNR in 1985.

The Calgary-Edmonton service carries approximately 40,000 passengers annually. The Alberta government is sponsoring a series of studies into the future potential of a frequent, downtown-

to-downtown high-speed service between the two cities. The other VIA services are important to Alberta both for the basic transportation links they provide to other parts of Canada and for tourism to the Banff and Jasper townsites.

The CNR operates a twice-weekly mixed freight-passenger service between Edmonton-Lac La Biche and Lac La Biche-Fort McMurray, providing the only surface transportation link to several communities in northeastern Alberta.

Intermodal yards have been developed by the railway companies in the major cities. The CNR operates one of the most modern near Fort McMurray, specifically designed for local purposes. It currently handles about 200,000 tonnes per year, although capacity is more than double that figure.

The railways are essential to the movement of bulk commodities such as grains, timber products, coal, sulphur, petrochemicals, and other products to world markets. Bulky processed and manufactured products, particularly for long hauls, are well handled. Industrial developments in northern Canada and northern Alberta are especially contingent on adequate rail service, but all areas of the province require this mode of transport for the maintenance and continuation of balanced growth.

Although not within the provincial boundaries of Alberta there are extensive plant capacity expansion programs now underway. CP Rail, for example, is into the second year of construction of the Mount MacDonald \$600 million tunnel while CN Rail continues its double tracking program through the mountain corridors. An efficient, high capacity rail system is essential to the competitive position of Alberta shippers in the world markets.

Water Transport

Many Alberta products are delivered to customers outside the province by a combination of overland and marine transport. Water transport is important to Alberta industries because it allows bulk and packaged products to be moved to distant customers in northern Canada and overseas at relatively low cost.

Freight originating in Alberta is transported on inland waterways and on major ocean trade routes. The most important inland waterways serving

Alberta are the Mackenzie River, which moves Alberta cargoes as far north as the Beaufort Sea, and the St. Lawrence Seaway, which transports goods to the eastern United States, to Europe, and to the near eastern countries.

The Mackenzie River system, ice free only four months of the year, flows some 1,770 kilometres north from Great Slave Lake to the Beaufort Sea in the Canadian Arctic. During the 1983 shipping season, 191,000 tonnes of cargo were transported down the river on shallow draft barges. Just over half of this tonnage represents community resupply shipments, while the remainder is project freight related to the increasing amount of exploration for oil and gas underway in the region. A significant portion of the freight moving on the Mackenzie River is transshipped through Alberta.

Cargoes are usually consolidated in Edmonton and forwarded by rail or truck to Hay River, N.W.T., the main staging area for barging operations. The amount of tonnage moving on the Mackenzie River route is expected to increase dramatically during the next ten years as mining and petroleum developments accelerate in the Northwest Territories and on the Beaufort Sea.

Alberta products move to overseas markets primarily through the Ports of Vancouver and Prince Rupert in British Columbia, through the Port of Thunder Bay on Lake Superior and the Port of Montreal in Quebec. Ocean going vessels carry grain, coal, sulphur, (about 21 million tonnes in 1981), and a variety of other agricultural and manufactured products from Alberta. Many of these commodities have unfavourable value to weight ratios, and are therefore particularly sensitive to the total cost of transportation to their final market destinations. The availability of efficient, low cost marine transport allows products to be sold in distant markets at competitive delivered prices.

TABLE 5.6

**NORTHBOUND
WATER FREIGHT
SHIPPED VIA FORT
McMURRAY AND
HAY RIVER
-1961-1983**

	Ft. McMurray (tonnes)	Hay River (tonnes)	Total (tonnes)
1961	23,369	36,134	59,502
1962	56,460	33,726	90,186
1963	55,973	34,895	90,869
1964	55,111	43,439	98,550
1965	49,130	36,809	85,939
1966	39,264	30,241	69,504
1967	39,272	33,283	72,555
1968	46,825	58,398	105,223
1969	34,647	110,935	145,582
1970	31,288	125,581	156,869
1971	33,493	108,976	142,469
1972	24,943	224,056	248,999
1973	23,071	166,195	189,266
1974	39,837	172,995	212,832
1975	35,174	197,503	240,842
1976	36,959	155,592	192,551
1977	53,988	106,000	159,988
1978	58,391	117,280	175,671
1979	69,716	122,589	192,305
1980	50,211	136,399	186,610
1981	46,499	164,940	211,439
1982	14,850	177,344	192,194
1983	9,487	182,651	191,257

Source: Northern Transportation Co. Ltd



Market Data

Personal Income Tax Data

The data in this section were compiled from individuals' personal income tax returns. Since the returns show place of residence, occupation, and employer, it is possible to obtain much detailed information on annual and regional bases. Relative affluence, growth or stagnation, within census divisions, and changes in average incomes of occupational groupings, are shown. Reasons for some of the fluctuations and changes can only be inferred from knowledge of local and economic events for specific years. The

general pace of economic growth and inflation can be observed.

Since 1971, Alberta's total personal income has increased six fold, reaching \$25.6 billion in 1981. Seventy per cent of this income was earned in census divisions 6 and 11, which include the province's two major cities, Calgary and Edmonton. The largest and most important component of personal income has been labour income (wages and salaries) which accounted for 72.9 per cent of the 1981 total.

Per capita personal income increased from \$2,512 in 1971 to \$11,440 in 1981. During this period, the greatest per capita increase in average income was recorded

TABLE 6.1

TOTAL AND PER CAPITA REPORTED TAXABLE PLUS NON-TAXABLE INCOME BY CENSUS DIVISION ALBERTA 1961 - 1971 - 1981 (TOTALS IN MILLIONS OF DOLLARS; PER CAPITA IN DOLLARS)

Census Division	1961		1971		Change Per Capita 1961-1971 (%)	1981		Change Per Capita 1971-1981 (%)
	Total	Per Capita	Total	Per Capita		Total	Per Capita	
1	42.9	1,096	88.3	2,253	105.6	578.3	10,443	363.5
2	88.0	1,056	197.9	2,286	116.5	1,122.8	10,163	344.6
3	22.0	710	54.3	1,745	145.8	271.3	7,610	336.1
4	12.5	832	23.4	1,803	116.7	124.3	10,257	468.9
5	34.4	903	53.4	1,547	71.3	366.9	9,559	517.9
6	475.5	1,495	1,391.9	3,111	108.1	9,064.3	13,555	335.7
7	29.5	722	61.8	1,613	123.4	375.9	9,381	481.6
8	70.9	926	171.6	2,005	116.5	1,183.6	9,573	377.5
9	24.5	1,208	59.0	2,982	146.9	237.8	10,974	268.0
10	43.7	623	104.7	1,591	155.4	740.5	9,443	493.5
11	566.2	1,379	1,571.3	2,844	106.2	8,990.2	11,798	314.8
12	18.3	387	65.8	1,205	211.4	795.9	9,450	684.2
13	21.7	478	56.0	1,278	167.4	436.2	8,123	535.6
14	19.0	985	47.0	2,167	120.0	256.4	10,408	380.3
15	45.0	585	143.3	1,512	158.5	1,056.2	8,211	443.1
Total Alberta	1,514.0	1,137	4,089.2	2,512	120.9	25,600.6	11,440	355.4

Source: Revenue Canada, Taxation "Taxation Statistics"

Downtown Edmonton
Capital of Alberta

in census division 12 — a reflection of the growth of Fort McMurray and of the initial industrial development related to the oil sands processing plants.

Between 1971 and 1981, the average income of taxable Albertans more than tripled to reach \$23,330. In 1981, professionals recorded the highest average income — \$38,017. Perhaps more surprising is the reported fourfold increase in average pensioners income. It is difficult to determine the changes in

real incomes, but it is likely that the increases more than offset the inflation during the period.

Of the total Alberta taxfilers in 1981, over 63 per cent reported incomes exceeding \$10,000 while 33 per cent reported incomes of \$20,000 and over.

In 1981, over half of the declared personal income of Alberta taxfilers was earned by persons less than 37. One quarter was earned by taxfilers 28 years of age and younger.

TABLE 8.1

**AVERAGE TOTAL
INCOME OF
TAXABLE PERSONS
BY
OCCUPATIONAL
CLASSES, ALBERTA,
1971 and 1976-
1981 (DOLLARS)**

	1971	1976	1977	1978	1979	1980	1981
Total Employees	7 166	13 831	15 004	16 511	17 746	19 611	22 072
Employees of Business	7 154	14 047	15 057	16 567	17 847	19 755	22 259
Employees of Institutions	5 444	10 913	12 283	13 784	14 245	16 360	18 733
Teachers and Professors	9 742	16 977	18 163	21 747	22 559	23 596	27 455
Federal Employees	7 865	13 877	15 638	17 619	19 063	21 054	23 875
Provincial Employees	7 128	13 787	15 596	16 053	18 048	19 886	21 605
Municipal Employees	7 230	13 403	15 169	16 293	17 926	19 494	22 064
Armed Forces		14 200	15 312	16 685	17 022	18 709	20 696
Unclassified	4 615	10 127	12 087	13 169	13 684	15 846	16 194
Farmers and Fishermen	6 291	16 832		18 800	21 572	22 653	27 863
Total Professionals	24 403	36 417	31 789	33 710	34 227	36 802	38 017
Accountants	15 449	29 364	31 368	32 260	39 070	42 519	38 824
Medical Doctors and Surgeons	40 254	50 066	48 088	50 557	58 091	70 984	71 440
Dentists	28 058	44 485	42 474	44 929	54 866	57 866	59 063
Lawyers and Notaries	26 004	52 714	45 438	51 567	50 286	53 737	71 953
Engineers and Architects	18 395	45 911	32 578	39 494	42 032	64 357	48 379
Entertainers and Artists	4 501	9 933	9 163	10 962	11 392	12 654	13 694
Other Professionals	12 215	19 384	19 207	21 579	21 642	23 310	25 478
Salesmen	7 874	15 559	18 429	19 081	21 215	23 108	23 116
Total Business Proprietors	7 246	14 693	16 392	18 476	19 581	20 955	21 165
Forestry Operators	5 000	24 180	17 000	33 444	19 762	17 278	14 992
Manufacturers	8 197	13 958	13 760	14 858	17 372	19 067	18 957
Construction	7 214	14 325	15 319	16 305	16 433	17 273	18 065
Public Utilities	6 363	12 940	14 443	15 371	16 866	17 148	17 633
Wholesale Traders	8 655	15 657	17 320	27 799	24 049	29 741	42 739
Retail Traders	7 569	14 632	16 936	18 328	18 617	19 588	20 865
Insurance Agency Operators	10 510	47 292	21 302	22 857	28 029	29 875	20 795
Real Estate Agency Operators	11 643	29 448	39 377	41 129	38 361	50 582	63 589
Other Finance	19 405	45 517	44 750	61 229	63 533	80 850	47 596
Recreational Services Operators	4 955	18 163	20 099	24 651	23 988	42 442	21 363
Business Services Operators	6 843	13 889	13 862	12 964	16 683	14 612	17 000
Other Service Operators	6 614	13 830	16 172	16 653	18 581	18 725	18 983
Other Business Proprietors	8 172	18 855	21 264	39 791	48 098	62 288	69 118
Total Investment	6 580	19 334	21 758	28 336	32 818	35 649	38 584
Investors	6 540	19 958	22 196	29 468	34 113	36 975	39 582
Property Owners	6 753	16 649	19 700	22 140	23 974	25 301	29 332
Pensioners	4 250	12 006	12 668	14 002	14 512	15 972	17 206
Unclassified	5 167	9 709	10 674	11 934	15 417	16 377	16 740
All Classes	7 189	14 323	15 469	17 214	18 739	20 700	23 330

Note: A Provincial legislative Act passed in 1976 allowed for the introduction of professional corporations. This accounts for the drop in 1977 income shown for many of the professional occupation categories. Year-to-year data fluctuations may be the result of sample variations.

Source: Revenue Canada Taxation: "Taxation Statistics"

TABLE 6.3

**NUMBER OF
TAXFILERS* BY
INCOME CLASSES -
ALBERTA AND
MAJOR CITIES -
SELECTED YEARS
-1965-1981
(THOUSANDS)**

Income Classes	1965	1971	1973	1975	1976	1977	1978	1979	1980	1981
Alberta										
Under \$1,000	64.9	79.0	56.4	45.4	42.6	39.9	125.9	117.3	109.9	99.5
\$1,000 - \$5,000	298.2	311.4	298.4	242.4	228.2	208.7	213.6	203.8	193.1	172.9
\$5,000 - \$10,000	122.1	221.3	260.3	265.1	265.7	274.3	272.7	268.2	263.6	252.2
\$10,000 - \$20,000	17.7	95.0	165.5	279.2	314.7	342.2	370.0	398.9	421.5	427.3
\$20,000 and over	3.1	11.4	24.6	83.2	129.1	162.8	204.8	270.0	354.3	475.0
Total Taxfilers	505.9	718.1	805.2	915.4	980.4	1,027.9	1,187.0	1,258.2	1,342.4	1,426.9
Calgary										
Under \$1,000	15.3	21.1	14.6	12.6	10.5	9.7	26.8	24.3	22.5	19.8
\$1,000 - \$5,000	76.0	83.8	77.0	66.0	62.3	58.8	58.0	55.5	52.4	47.0
\$5,000 - \$10,000	36.0	67.3	75.9	73.8	77.9	79.9	77.3	76.2	73.9	69.6
\$10,000 - \$20,000	6.3	31.9	51.7	81.7	94.3	101.4	108.8	119.0	127.1	130.0
\$20,000 and over	1.3	5.0	9.1	25.8	40.1	48.0	63.1	82.7	108.1	130.8
Edmonton										
Under \$1,000	18.8	20.8	17.5	12.1	11.5	11.7	32.1	29.5	27.9	24.4
\$1,000 - \$5,000	90.9	95.1	97.7	76.3	72.3	63.2	64.2	60.5	56.7	50.1
\$5,000 - \$10,000	43.6	78.4	88.3	88.3	83.1	86.6	85.2	82.4	79.2	73.3
\$10,000 - \$20,000	6.4	36.2	61.1	96.9	108.1	116.5	125.8	133.2	138.4	136.3
\$20,000 and over	1.1	4.2	8.6	29.9	46.9	60.6	71.1	91.5	117.3	151.2
Lethbridge										
Under \$1,000	2.5	1.7	1.5	1.2	1.3	1.2	3.1	3.0	2.7	2.5
\$1,000 - \$5,000	10.7	10.2	9.6	7.0	7.0	6.2	6.0	-	5.3	4.5
\$5,000 - \$10,000	3.8	7.0	7.9	8.5	8.4	7.8	7.7	7.5	7.2	6.9
\$10,000 - \$20,000	.5	2.5	4.2	8.0	9.0	9.9	10.8	11.3	11.7	11.5
\$20,000 and over	.1	.4	.7	2.2	3.3	4.0	4.7	6.4	8.3	11.4
Medicine Hat										
Under \$1,000	.8	1.2	.9	.8	.6	.7	2.5	2.3	2.2	2.0
\$1,000 - \$5,000	6.6	6.3	5.5	5.2	4.9	3.8	4.2	4.3	3.9	3.4
\$5,000 - \$10,000	2.3	4.1	5.0	3.1	5.3	5.4	5.2	5.3	5.2	5.0
\$10,000 and over	.3	1.5	3.3	6.8	8.7	10.5	10.8	12.5	14.5	16.3
Red Deer										
Under \$1,000	.9	1.7	1.0	.8	.7	.7	2.2	2.1	2.1	2.0
\$1,000 - \$5,000	6.7	6.6	6.5	4.8	4.1	4.2	4.5	4.4	4.4	4.2
\$5,000 - \$10,000	2.4	4.5	5.7	6.0	5.8	5.5	5.8	5.8	5.9	5.9
\$10,000 and over	.4	2.1	3.4	7.8	9.6	10.9	12.8	14.8	17.9	20.9

Source: Revenue Canada, Taxation "Taxation Statistics"

* Note: Includes taxable plus non-taxable taxfiler returns

TABLE 6.3

DISTRIBUTION OF ALL TAXFILERS RETURNS (TAXABLE AND NON-TAXABLE BY SOURCES OF INCOME - ALBERTA AND MAJOR CITIES - 1975-1981 - MILLIONS OF DOLLARS

Taxation Year	Total Number of Returns	Wages & Salaries	Commissions & Other Employment Earnings	Family Allowances	Unemployment Insurance Benefits	Old Age, CPP or Other Pensions	Net Business Income	Net Professional Income	Net Commission Income	Net Farming or Fishing Income
Edmonton										
1975	303.5	2 566.3	74.9	41.4	27.7	74.5	57.5	77.4	7.5	7.2
1976	322.0	3 035.6	95.9	43.7	31.7	88.9	65.2	89.8	9.8	2.7
1977	338.6	3 531.5	109.1	48.9	38.5	93.5	66.6	93.9	11.6	2.5
1978	379.9	3 894.4	115.2	50.0	46.9	122.4	70.0	91.1	14.4	2.9
1979	396.7	4 575.7	146.1	41.3	43.6	132.3	66.7	88.2	14.1	2.6
1980	421.5	5 346.3	173.8	45.3	56.0	177.3	72.6	100.6	12.8	3.0
1981	443.7	6 359.6	181.6	50.8	58.7	241.2	68.4	119.7	14.9	5.5
Calgary										
1975	259.8	2 156.5	69.0	35.1	28.9	59.8	43.3	79.2	10.4	5.4
1976	285.1	2 673.1	95.4	37.6	27.7	75.8	44.5	98.9	12.0	3.0
1977	297.8	2 973.0	88.6	40.3	35.6	93.0	48.5	92.8	6.8	3.9
1978	332.7	3 448.0	116.0	46.3	49.5	111.0	33.1	109.3	13.1	6
1979	359.6	4 143.8	162.5	36.6	44.1	128.0	33.4	111.5	12.2	8.2
1980	386.1	4 950.0	214.4	39.2	48.6	158.1	33.2	159.4	18.6	6
1981	415.6	6 291.9	270.6	42.5	56.2	189.6	36.6	182.5	20.9	10.1
Lethbridge										
1975	27.0	193.0	7.7	3.6	2.7	8.7	7.8	8.5	7	8.5
1976	29.0	224.2	11.7	3.7	2.4	13.1	8.2	7.9	7	6.0
1977	29.1	248.5	8.3	4.5	3.9	12.7	9.7	8.9	10	4.4
1978	30.6	266.5	11.8	4.5	3.9	13.5	9.8	9.4	3	4.6
1979	32.7	303.9	11.1	3.4	3.5	20.2	8.3	11.6	11	7.2
1980	33.9	341.5	12.5	4.1	4.5	24.0	10.7	11.9	5	2.1
1981	36.4	427.9	15.7	4.4	4.3	26.5	7.8	11.6	2.0	12.0
Medicine Hat										
1975	17.9	118.9	2.4	2.8	2.1	6.2	4.9	3.4	4	11.9
1976	19.5	157.3	4.6	2.9	2.1	6.2	8.7	3.8	2	11.3
1977	20.5	178.7	4.1	3.4	2.7	9.0	7.5	3.3	5	8.3
1978	22.4	183.1	5.3	3.2	3.9	10.4	8.0	4.2	3	5.3
1979	25.5	240.5	6.6	2.9	3.3	14.3	9.0	4.5	2	9.8
1980	26.1	272.0	4.4	2.9	4.5	14.2	10.1	4.2	4	9.2
1981	25.7	297.9	8.5	3.5	3.6	16.1	8.2	5.0	5	14.1
Red Deer										
1975	19.5	146.1	6.3	2.9	1.7	4.3	5.5	5.2	6	5.3
1976	20.2	174.2	8.9	2.9	2.5	5.9	3.9	6.8	10	1.2
1977	21.2	199.7	6.0	2.9	2.1	6.3	6.8	6.9	5	2.9
1978	26.2	238.2	8.5	3.9	3.4	8.8	8.9	6.6	8	3.4
1979	29.1	293.4	10.4	2.9	3.6	9.0	6.1	6.5	6	2.2
1980	31.1	358.3	19.4	3.7	4.4	11.3	6.6	8.2	14	3.4
1981	32.2	417.4	15.3	4.3	4.1	16.4	8.4	9.1	11	1.4
Alberta										
1975	915.4	6 952.3	185.4	142.2	91.6	218.1	223.0	206.6	27.1	368.5
1976	980.4	8 426.9	244.8	148.5	98.2	278.5	245.7	244.2	34.2	277.5
1977	1 027.9	9 661.0	268.8	163.2	121.4	312.0	266.2	250.0	30.5	257.2
1978	1 186.1	11 007.4	318.9	182.0	158.4	375.6	268.3	266.6	39.5	264.5
1979	1 261.0	13 117.5	406.1	145.2	142.9	433.0	287.4	273.1	39.6	361.8
1980	1 345.4	15 590.6	503.9	159.7	169.5	543.3	305.3	341.3	48.1	322.6
1981	1 426.0	19 034.0	592.2	179.6	182.7	653.9	338.3	393.7	53.6	409.5

TABLE 6.4**CONTINUED**

	Taxable Amounts of Dividends	Bond & Bank Interest	Mort- gage Interest	Income From Trusts	Annuity & Other Cdn. In- vestment Income	Foreign Invest- ment Income	Net Rental Income	Net Taxable Capital Gains	Miscel- laneous Income	Total Income Assessed
Edmonton										
1975	33.1	97.8	8.7	6.2	9.7	1.3	11.6	20.3	27.1	3 149.9
1976	39.3	118.8	14.0	8.7	21.5	2.1	3.9	36.5	35.1	3 743.1
1977	51.4	142.5	8.2	7.3	25.3	2.8	1.3	42.8	42.0	4 311.1
1978	120.2	191.7	10.2	8.8	15.0	2.4	10.9	65.8	62.3	4 872.6
1979	197.3	249.7	15.2	11.8	18.7	3.5	-21.6	88.2	81.1	5 749.3
1980	268.1	346.1	18.6	10.5	27.8	3.4	-25.4	130.1	106.3	6 867.3
1981	352.6	475.4	19.6	13.1	41.3	6.5	-19.5	133.8	125.1	8 282.4
Calgary										
1975	42.2	83.3	7.3	7.6	14.1	4.1	11.6	19.0	29.9	2 706.9
1976	47.7	107.7	10.1	6.1	17.5	2.7	11.6	39.9	35.4	3 346.7
1977	58.4	131.1	6.9	8.3	27.1	3.2	.9	58.1	43.8	3 718.5
1978	145.9	170.6	7.1	7.7	20.2	4.3	-7.6	95.0	85.2	4 455.4
1979	220.4	237.2	7.4	11.1	24.3	9.9	-16.1	216.0	119.3	5 509.8
1980	306.7	316.0	10.6	15.0	48.1	10.3	16.2	209.3	152.0	6 674.2
1981	407.3	494.7	11.5	16.4	66.5	14.2	-45.6	231.2	153.0	8 430.2
Lethbridge										
1975	3.7	12.2	1.0	.5	.7	2	2.1	2.3	2.4	266.1
1976	4.7	15.4	1.2	.7	1.4	.1	2.4	3.5	2.5	309.7
1977	4.6	18.3	.7	.7	2.0	.1	1.4	4.4	3.7	337.7
1978	14.8	21.3	.5	8	2.4	.2	.7	5.2	3.7	374.0
1979	19.0	28.9	9	.9	2.6	.3	1.0	7.6	5.9	437.3
1980	27.0	37.4	.8	1.5	3.6	.3	7	10.7	7.0	505.8
1981	35.1	56.6	.6	1.7	4.3	.3	1.0	9.8	8.7	630.4
Medicine Hat										
1975	3.3	9.6	.7	.3	.9	-	1.3	2.1	1.5	172.8
1976	2.8	11.2	.9	2	2.0	1	1.2	2.9	2.5	220.9
1977	4.2	13.2	.5	8	2.4	.1	1.2	3.8	1.6	245.3
1978	8.1	17.1	.5	.4	2.5	.2	.7	4.8	2.8	260.8
1979	11.0	20.4	.7	.7	2.7	.1	.3	7.0	3.7	337.8
1980	16.3	28.3	.6	.5	3.9	.1	1.3	7.5	4.8	385.2
1981	18.9	43.2	1.0	1.0	4.8	.1	1.4	12.1	6.6	446.6
Red Deer										
1975	1.9	7.0	.7	4	.7	0	1.4	1.9	1.7	193.9
1976	2.5	8.8	1.4	4	1.2	.1	.9	3.9	2.0	228.7
1977	3.7	9.8	.7	.4	2.2	.1	1.3	4.5	2.7	259.5
1978	9.5	13.3	.5	1.2	2.4	.1	1.1	5.3	3.2	319.1
1979	15.0	17.1	.5	.6	2.8	.2	6	7.8	5.9	385.3
1980	22.9	23.5	.7	.6	2.9	.1	-.9	9.6	6.5	482.8
1981	27.6	33.4	1.0	1.0	3.7	.3	.4	9.9	7.8	561.7
Alberta										
1975	104.2	328.8	24.9	20.9	36.1	6.7	39.5	73.8	82.7	9 132.4
1976	122.4	403.9	35.4	22.1	63.5	6.0	36.7	142.5	102.1	10 936.3
1977	155.5	484.4	25.0	31.1	84.3	7.9	15.8	177.8	124.1	12 422.7
1978	394.9	626.8	28.4	27.3	69.4	8.6	-2.9	270.5	209.1	14 513.4
1979	623.8	831.5	36.9	36.2	85.6	15.8	-23.2	274.5	278.2	17 565.8
1980	883.8	1 139.5	43.2	41.3	131.3	16.5	-24.9	561.7	357.9	21 134.5
1981	1 201.1	1 750.2	51.3	51.7	184.9	25.1	-51.8	604.0	410.0	26 092.0

Source: Revenue Canada Taxation "Taxation Statistics"

TAB C 5

NUMBER OF
TAXABLE RETURNS,
TOTAL INCOME,
AVERAGE INCOME,
ALBERTA CITIES,
SPECIFIED YEARS
1971-1981

TAXABLE RETURNS				
	Year	No. of Filers	Total Income (\$ '000)	Average Income (\$)
Calgary	1971	166,057	1,265,907	7,623
	1973	188,166	1,709,627	9,086
	1975	191,226	2,536,641	13,265
	1977	221,968	3,464,517	15,608
	1979	264,394	5,507,766	19,130
	1981	326,363	7,903,270	24,216
Camrose	1971	3,501	21,350	6,098
	1973	3,900	29,480	7,559
	1975	4,225	50,580	11,971
	1977	4,526	64,297	14,206
	1979	5,366	90,924	16,944
	1981	6,461	137,860	21,337
Drumheller	1971	2,244	14,531	6,475
	1973	2,602	20,554	7,899
	1975	2,566	33,368	13,004
	1977	2,685	38,865	14,474
	1979	2,964	49,463	16,688
	1981	3,448	74,731	21,673
Edmonton (Metro)	1971	188,406	1,411,214	7,490
	1973	225,600	1,960,698	8,691
	1975	226,305	2,947,885	13,026
	1977	254,527	4,037,515	15,863
	1979	292,175	5,300,536	18,142
	1981	335,235	7,559,816	22,551
Fort McMurray	1971	2,439	21,693	8,894
	1973	3,603	35,406	9,826
	1975	6,239	99,342	15,922
	1977	9,752	186,302	19,103
	1979	12,055	258,239	21,421
	1981	15,329	426,750	27,839
Grande Prairie	1971	5,495	37,935	6,903
	1973	7,195	59,873	8,321
	1975	7,592	93,865	12,363
	1977	8,389	126,173	15,040
	1979	11,440	210,662	18,414
	1981	13,115	300,121	22,883
Leduc	1971	2,012	14,306	7,110
	1973	3,159	27,700	8,768
	1975	3,669	48,090	13,107
	1977	4,673	74,165	15,871
	1979	5,605	107,357	19,153
	1981	6,836	161,582	23,636
Lethbridge	1971	16,937	118,123	6,974
	1973	19,055	157,054	8,242
	1975	19,308	246,068	12,744
	1977	20,911	311,146	14,880
	1979	23,454	403,593	17,208
	1981	27,147	583,384	21,490
Lloydminster (Alberta Portion Only)	1971	1,879	12,853	6,840
	1973	2,177	18,194	8,357
	1975	2,966	38,898	13,114
	1977	3,428	54,064	15,771
	1979	4,577	88,635	19,365
	1981	6,003	143,247	23,862
Medicine Hat	1971	9,649	64,776	6,713
	1973	11,781	98,931	8,398
	1975	12,315	158,479	12,869
	1977	14,808	225,759	15,246
	1979	16,462	287,412	17,459
	1981	19,276	427,145	22,159

TABLE 6.5

CONTINUED

TAXABLE RETURNS				
	Year	No. of Filers	Total Income	Average Income
Red Deer	1971	11,362	77,039	6,780
	1973	13,591	108,904	8,013
	1975	14,394	180,139	12,515
	1977	15,918	241,580	15,177
	1979	19,488	339,343	17,413
	1981	24,639	530,676	21,538
St. Albert	1976	10,598	168,704	15,918
	1977	11,442	197,451	17,256
	1978	12,110	229,164	18,923
	1979	13,396	271,263	20,249
	1980	14,560	324,143	22,262
	1981	15,868	396,633	24,995
Wetaskiwin	1971	2,664	16,604	6,232
	1973	3,157	24,103	7,634
	1975	3,069	36,407	11,862
	1977	3,442	49,728	14,447
	1979	4,230	72,942	17,244
	1981	5,108	102,973	20,159

Source: Revenue Canada Taxation Statistics Unit

TABLE 6.6

NUMBERS AND DECLARED PERSONAL INCOME OF TAXFILERS BY AGES - ALBERTA - 1977-1981
(NUMBER FIGURES IN THOUSANDS - INCOME FIGURES IN MILLIONS OF DOLLARS)

Age	1977 No. Income		1978 No. Income		1979 No. Income		1980 No. Income		1981 No. Income	
Under 21	135.7	700.4	144.5	806.2	161.5	984.5	167.7	1,176.7	81.1	986.4
21	41.0	329.3	44.3	374.7	44.5	427.5	49.6	511.9	37.7	547.6
22	38.8	353.9	40.1	355.4	47.6	485.8	42.4	490.6	38.2	597.1
23	36.3	341.3	43.3	408.5	45.2	474.6	52.2	644.5	38.8	645.5
24	36.7	376.2	47.3	489.7	47.3	529.6	47.0	617.5	40.9	723.1
25	30.7	325.6	38.5	425.4	41.7	519.5	47.7	643.4	39.1	734.3
26	28.5	327.0	35.5	400.1	41.7	511.0	48.0	667.4	37.8	751.4
27	28.0	341.5	32.3	360.3	37.5	470.6	43.3	629.1	38.5	793.6
28	27.9	354.8	36.8	403.3	36.3	485.4	41.6	622.8	32.6	697.3
29	26.3	345.2	34.8	403.1	35.7	484.0	37.3	591.8	36.0	759.4
30	30.0	405.2	34.1	407.1	31.8	450.0	34.9	555.3	28.8	688.6
31	26.9	375.1	33.9	438.2	30.9	472.8	37.2	602.4	29.2	660.8
32	21.1	292.9	30.2	411.1	34.7	485.3	34.5	586.7	27.6	670.5
33	20.7	303.1	26.2	360.4	28.6	465.7	33.9	586.8	28.8	714.8
34	19.8	297.9	25.7	371.6	23.8	380.2	33.7	569.9	25.7	697.4
35	18.0	267.5	22.9	353.8	27.8	437.8	26.9	482.9	26.5	687.4
36	15.5	225.7	23.9	341.3	24.6	408.7	27.4	530.7	21.6	570.5
37	19.9	314.1	19.8	296.6	24.7	414.1	29.2	537.7	21.1	581.5
38	18.1	272.8	21.1	336.9	19.6	335.2	23.4	438.7	20.7	573.8
39	17.5	253.9	21.2	307.5	23.8	409.8	20.6	395.7	19.3	530.3
40	16.5	261.1	19.2	282.6	19.9	359.2	22.0	442.6	18.6	528.3
41	16.2	243.0	17.3	292.4	18.0	340.7	17.7	388.8	18.4	509.7
42	17.5	281.2	19.2	288.1	19.9	354.7	17.9	372.3	16.6	469.4
43	16.7	266.6	17.0	263.6	18.2	335.4	19.2	383.1	14.3	415.9
44	15.2	253.1	18.3	291.3	20.4	361.2	18.4	385.5	13.3	402.7
45	14.6	230.4	17.3	284.2	18.9	328.9	19.7	413.4	15.2	454.7
46	15.8	265.6	18.0	295.7	17.2	342.7	18.5	377.5	15.7	459.9
47	16.5	266.9	16.8	287.7	18.2	310.5	16.7	371.9	14.5	436.2
48	14.4	239.0	18.1	293.7	17.8	338.7	17.5	392.0	15.4	449.3
49	14.9	230.3	15.6	255.4	18.2	346.4	15.7	363.7	15.6	447.0
50	14.3	231.8	15.5	259.7	17.0	325.2	18.5	382.0	13.8	431.3

TABLE 6-A

CONTINUED

Age	1977		1978		1979		1980		1981	
	No.	Income	No.	Income	No.	Income	No.	Income	No.	Income
51	13.3	215.2	15.3	259.3	17.1	320.2	18.2	399.6	13.8	442.1
52	12.9	200.1	13.8	214.0	16.3	314.1	16.6	359.9	13.4	384.9
53	13.3	213.0	13.4	230.2	13.5	248.0	14.2	321.1	14.4	442.0
54	12.7	190.1	14.1	234.7	12.7	241.8	16.1	329.3	13.0	381.2
55	11.1	168.5	12.8	197.6	13.7	256.3	16.3	323.3	11.4	345.5
56	12.4	187.0	11.8	192.0	12.9	233.7	13.1	272.7	12.3	378.4
57	10.6	147.9	12.1	185.0	13.1	252.0	12.1	259.0	10.0	301.1
58	10.7	151.0	14.2	193.1	15.1	249.8	13.0	275.5	13.0	342.3
59	10.1	148.5	10.2	148.2	11.9	227.1	11.8	222.1	10.4	294.9
60	8.3	115.5	10.8	170.0	10.6	172.2	12.2	232.6	9.9	264.1
61	8.5	118.1	8.2	125.8	10.3	175.9	10.6	187.1	8.6	249.2
62	8.2	107.8	9.9	140.8	9.0	155.7	9.5	182.3	6.9	189.3
63	7.5	93.9	7.4	111.9	7.4	136.8	8.2	156.8	7.0	186.9
64	7.8	97.1	8.4	109.4	7.5	169.3	9.2	153.0	5.9	159.1
65	7.3	88.8	8.4	114.5	8.0	125.4	7.9	147.2	6.0	163.8
66	6.3	71.3	5.9	81.8	7.8	122.1	8.2	148.7	5.5	146.5
67	6.1	70.8	6.7	82.7	7.4	94.6	6.6	107.7	5.2	142.7
68	5.3	57.9	6.0	75.9	5.8	84.2	6.7	112.0	5.6	139.8
69	4.9	50.3	4.9	60.5	5.5	69.8	5.1	81.2	5.3	136.1
70	4.4	42.6	4.1	50.4	5.0	70.5	6.4	91.7	4.5	106.1
Over 70	35.5	313.0	38.0	388.3	37.6	469.1	42.7	611.9	29.5	762.6
Not Stated	1.0	1.7	5	1.7	4	1.8	6	4.4	3	8.1
Total	1,027.9	12,422.6	1,186.0	14,513.4	1,261.0	17,565.8	1,345.4	21,134.5	1,051.6	24,532.4

Note: Figures may not add due to rounding.

Retail Trade

View of the interior of World City Mall - World's Largest Retail Complex



One measure of prosperity or affluence and of changing emphases in buying habits is evident from retail trade figures. In recent years, the impact and, to an even greater extent, the uneven impact of inflation on costs and prices has clouded perception of real changes. The price of a unit package of goods and services may vary from province to province, and within provinces, because of differences in distribution costs, of differences in needs or habits, of local differences in production costs, of competitive factors, or simply because sellers take advantage of the relative prosperity of areas to maximize their incomes and turnover. Thus interregional and interclassificational comparisons of sales may not be as meaningful as raw figures would indicate.

Apparent retail trade volume, as measured by value of sales, in Alberta more than quadrupled between 1972 and 1983 although the population only rose by approximately 700,000. Much of the increase was caused by inflation; the consumer price index rose from 44.2 to 117.2 over the period, making it difficult to estimate the actual increases in real value.

TABLE 6.7

**RETAIL TRADE BY
TYPE OF OUTLET -
ALBERTA - 1972
AND 1979-1983**

Type of Store	1972	1979	1980	1981	1982	1983
Combination Stores (Grocery & Meat)	492.4	1,161.2	1,375.5	1,618.1	1,771.1	1,882.4
Grocery, Confectionery & Sundries Stores	70.5	254.4	317.4	390.0	418.8	417.2
All Other Food Stores	31.7	56.1	62.5	92.0	94.0	98.5
Department Stores	440.2	1,175.0	1,335.2	1,521.3	1,504.4	1,528.4
General Merchandise Stores	108.6	209.2	228.3	238.8	245.2	247.1
General Stores	65.3	293.5	367.0	442.4	586.3	600.1
Variety Stores	38.0	62.6	69.1	72.8	69.6	64.5
Motor Vehicle Dealers	560.7	2,003.0	2,202.7	2,405.4	1,967.8	1,965.8
Used Car Dealers	-	-	11.4	21.0	12.8	16.0
Service Stations	179.5	467.0	513.6	669.7	678.4	719.7
Garages	22.3	43.0	58.5	72.5	62.5	54.9
Automotive Parts & Accessories	37.8	128.5	175.8	220.3	260.0	274.4
Men's Clothing Stores	41.5	125.4	150.3	167.5	160.5	177.4
Women's Clothing Stores	41.5	137.7	167.5	199.0	212.5	221.9
Family - Clothing Stores	34.0	108.7	128.6	149.0	141.3	170.4
Family Shoe Stores	15.7	50.7	69.9	72.9	80.7	87.5
Hardware Stores	43.9	75.2	74.3	77.1	84.2	87.3
Household Furniture Stores	32.6	112.2	130.2	145.5	111.2	118.8
Household Appliance Stores	23.8	26.6	35.9	49.8	62.6	63.9
Furniture, T.V., Radio & Appliance Stores	13.3	60.4	56.1	59.2	49.5	49.2
Pharmacies, Patent Medicine & Cosmetic Stores	77.8	240.6	281.3	342.0	419.9	482.1
Book & Stationery Stores	4.0	28.3	31.2	34.2	38.9	44.3
Florists	7.0	29.4	43.5	48.9	53.5	62.5
Jewellery Stores	18.5	73.7	89.5	101.5	108.5	108.5
Sporting Goods & Accessories Stores	28.9	107.6	133.9	159.9	164.6	154.5
Personal Accessories Stores	18.3	85.8	105.0	115.8	117.5	110.2
All Other Stores	335.2	926.5	1,210.1	1,417.0	1,464.9	1,496.1
Total	2,728.3	8,052.8	9,410.7	10,906.4	10,941.3	11,303.5

Source: Statistics Canada; Retail Trade Cat. No.'s 63005 & 63224

Rising personal incomes were the primary force behind this growth. There has been a marked slow-down in the rate of increase of value of retail sales since 1981.

Based on an annual survey conducted by the Alberta Bureau of Statistics for 1982, retail and service trade data are broken down by census divisions. According to the survey the twelve cities of the province generated 76 per cent of retail receipts. Edmonton and Calgary, with 52 per cent of the population generated 59 per cent of the total.

Full time employees of retail establishments exceeded 73,000 persons, part time employees nearly 58,000. Full time employees of service trade establishments numbered over 46,000, and part time employees over 31,000. Total payroll of retail and service trade establishments exceeded \$2.4 billion.

TABLE 15.3

PRINCIPAL
STATISTICS - RETAIL
AND SERVICE
TRADE BY CENSUS
DIVISIONS -
ALBERTA - 1982

Census Divisions	Outlets No.	Employees (number)		Payroll \$ 000 000	Receipts \$ 000 000
		Full Time	Part Time		
1					
Retail Trade	381	2 080	1 356	43.3	362
Service Trade	163	1 002	661	14.1	51
2					
Retail Trade	884	3 963	2 474	64.5	744
Service Trade	322	1 880	1 396	28.8	107.1
3					
Retail Trade	280	843	459	16.9	182
Service Trade	115	296	251	4.1	23
4					
Retail Trade	137	260	159	5.3	66
Service Trade	49	193	88	2.3	11
5					
Retail Trade	308	851	511	17.0	171
Service Trade	127	398	252	5.9	25
6					
Retail Trade	3 210	21 591	18 890	521.9	4 596
Service Trade	1 705	14 445	9 547	245.5	897
7					
Retail Trade	444	1 153	693	22.1	236
Service Trade	172	487	419	7.2	32
8					
Retail Trade	907	4 428	2 877	97.0	871
Service Trade	383	2 158	1 805	34.1	136
9					
Retail Trade	274	980	753	19.5	170
Service Trade	293	3 050	3 138	48.4	184
10					
Retail Trade	645	2 455	1 382	49.9	470
Service Trade	243	967	848	15.1	62
11					
Retail Trade	3 728	26 963	24 018	636.4	5 373
Service Trade	1 697	16 623	10 451	270.8	945
12					
Retail Trade	503	2 078	1 203	46.1	455
Service Trade	214	1 335	728	19.4	77
13					
Retail Trade	402	1 334	652	25.8	266
Service Trade	169	800	409	10.9	40
14					
Retail Trade	180	706	419	13.8	146
Service Trade	91	505	300	8.0	33
15					
Retail Trade	848	3 407	1 766	73.0	725
Service Trade	338	1 935	1 178	30.5	123

Source: Census of Economic Activity

TABLE A.V

**CHEQUES CASHED
IN CLEARING
CENTRES BY TYPE
OF ACCOUNT -
ALBERTA - 1970-
1983 (MILLIONS
OF DOLLARS)**

Type and Year	Calgary	Edmonton	Lethbridge	Medicine Hat	Total 4 Centres
Current					
1970	26,429	19,799	1,098	396	47,722
1971	27,988	20,377	1,201	455	50,022
1972	31,336	22,651	1,329	484	55,800
1973	39,717	30,522	1,645	560	72,444
1974	58,959	40,128	2,008	704	101,799
1975	73,016	55,146	2,279	807	131,248
1976	96,939	66,387	2,607	1,107	167,040
1977	108,126	80,489	2,866	1,176	192,656
1978	129,519	98,045	2,951	1,461	231,976
1979	171,729	125,003	3,576	2,591	302,898
1980	221,365	152,654	4,216	3,395	381,630
1981	315,340	195,528	5,175	3,520	519,563
1982	361,354	229,081	5,086	2,955	598,476
1983	325,137	236,981	5,200	2,531	569,849
Savings					
1970	1,793	730	69	42	2,634
1971	1,031	794	73	41	1,939
1972	1,025	840	92	47	2,004
1973	1,175	1,071	115	65	2,426
1974	1,510	1,671	147	86	3,415
1975	1,699	1,899	175	91	3,864
1976	2,116	1,871	177	116	4,280
1977	2,597	2,316	191	113	5,218
1978	2,879	2,958	267	143	6,247
1979	4,530	3,507	351	193	8,582
1980	6,747	5,234	453	260	12,694
1981	9,889	7,972	727	417	19,005
1982	12,051	12,780	763	529	26,123
1983	10,403	15,771	818	519	27,511
Personal Chequing					
1970	673	578	67	35	1,352
1971	735	674	78	41	1,528
1972	1,042	996	111	55	2,203
1973	1,456	1,437	149	74	3,117
1974	1,857	2,131	211	102	4,300
1975	2,411	2,197	277	137	5,022
1976	3,325	2,808	370	190	6,693
1977	4,070	3,406	395	196	8,068
1978	4,939	4,249	473	227	9,888
1979	6,374	4,883	607	293	12,156
1980	7,752	5,357	651	340	14,100
1981	9,918	6,353	717	383	17,370
1982	9,431	5,878	715	402	16,426
1983	9,329	6,490	740	387	16,946

TABLE 4.9

CONTINUED

Type and Year	Calgary	Edmonton	Lethbridge	Medicine Hat	Total 4 Centres
Total Cheques Cashed					
1970	28 896	21 107	1 233	473	51 709
1971	29 754	21 845	1 353	538	53 490
1972	33 403	24 487	1 532	585	60 007
1973	42 348	33 031	1 909	699	77 987
1974	62 325	43 930	2 367	891	109 514
1975	77 126	59 242	2 732	1 034	140 135
1976	102 380	71 066	3 155	1 413	178 013
1977	114 792	86 211	3 453	1 486	205 942
1978	137 338	105 252	3 690	1 831	248 111
1979	182 632	133 393	4 534	3 077	323 636
1980	235 864	163 245	5 320	3 995	408 424
1981	335 147	209 852	6 619	4 319	555 938
1982	382 836	247 738	6 564	3 886	641 024
1983	344 877	259 247	6 758	3 437	614 319

NOTE: Component items may not add to total due to rounding.

Consumer Price Indexes

The consumer price index (C.P.I.) is based on the cost of a fixed, commonly purchased "basket of goods and services" as determined during some specified time period. Costs of the various items of the basket change at different rates over time; they also change at different rates from city to city. The weights assigned to the items in the basket of goods and services were last updated in 1978 for selected cities and Canada as a whole.

It is to be noted that comparative intercity living costs cannot be determined from the tables in this publication. The 1978 base cost of the basket in say, Montreal, may have been much higher (or lower) than the cost of the identical basket in, say, Calgary. The C.P.I. measures the changes in each city independently. The annual percentage change for each city index measures the price movements, or the rate of inflation, in that city.

Nor should it be assumed that component index changes have an even

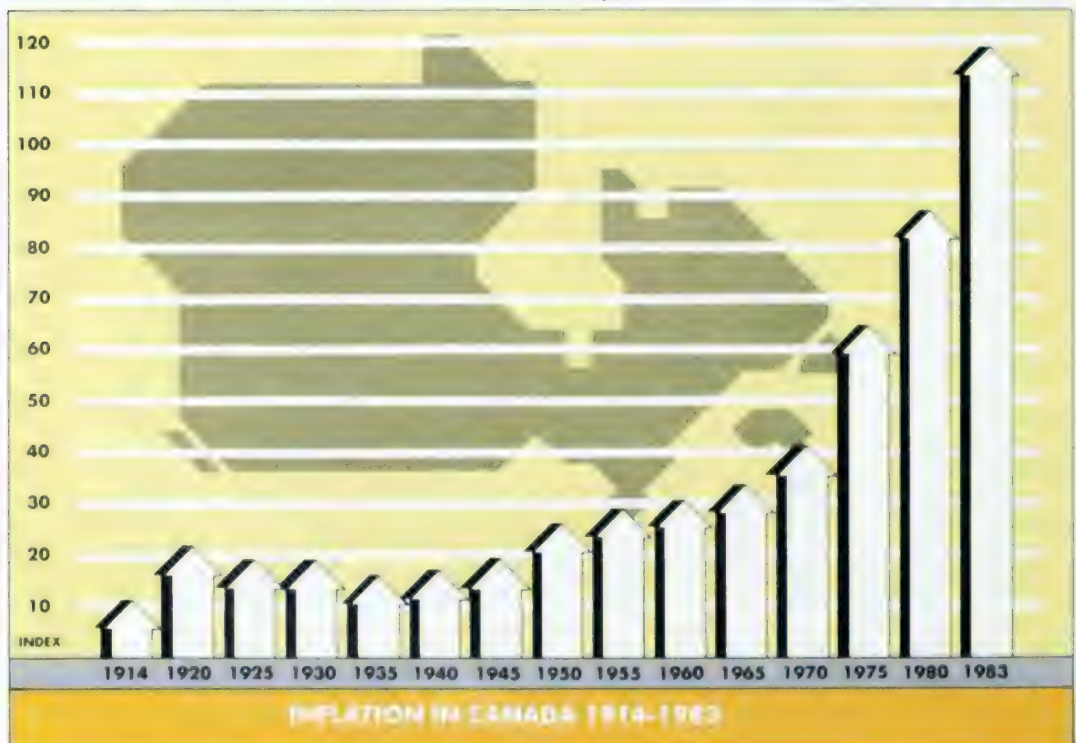


TABLE 6.10

CONSUMER PRICE INDEX, ALL ITEMS - CANADA - 1914-1983 (1981 = 100)

Year	Index	Year	Index	Year	Index
1914	12.2	1937	15.4	1960	31.4
1915	12.4	1938	15.6	1961	31.6
1916	13.4	1939	15.5	1962	32.0
1917	15.9	1940	16.1	1963	32.6
1918	18.0	1941	17.0	1964	33.2
1919	19.8	1942	17.9	1965	34.0
1920	22.9	1943	18.2	1966	35.2
1921	20.2	1944	18.3	1967	36.5
1922	18.5	1945	18.4	1968	38.0
1923	18.5	1946	19.0	1969	39.7
1924	18.2	1947	20.8	1970	41.0
1925	18.4	1948	23.7	1971	42.2
1926	18.6	1949	24.5	1972	44.2
1927	18.3	1950	25.2	1973	47.6
1928	18.3	1951	27.9	1974	52.8
1929	18.6	1952	28.5	1975	58.5
1930	18.4	1953	28.3	1976	62.9
1931	16.6	1954	28.5	1977	67.9
1932	15.1	1955	28.5	1978	73.9
1933	14.4	1956	28.9	1979	80.7
1934	14.6	1957	29.8	1980	88.9
1935	14.7	1958	30.6	1981	100.0
1936	15.0	1959	31.0	1982	110.8
				1983	117.2

Source: Statistics Canada - Consumer Prices and Price Indexes - Cat No. 62-010

TABLE 6.11

CONSUMER PRICE INDEXES FOR CANADA, MAJOR COMPONENTS (1981 = 100)

	All Items	Food	Housing	Clothing	Transportation	Health and Personal Care	Recreation Reading and Education	Tobacco and Alcohol
1969	39.7	33.3	40.3	50.5	38.9	42.4	49.0	46.4
1970	41.0	34.1	42.3	51.5	40.4	44.3	50.7	47.0
1971	42.2	34.4	44.2	52.2	42.1	45.2	52.4	47.8
1972	44.2	37.0	46.2	53.6	43.2	47.4	53.8	49.1
1973	47.6	42.4	49.2	56.3	44.3	49.7	56.1	50.6
1974	52.8	49.4	53.5	61.7	48.7	54.0	61.0	53.4
1975	58.5	55.8	58.9	65.4	54.4	60.2	67.3	59.9
1976	62.9	57.3	65.4	69.0	60.3	65.3	71.3	64.2
1977	67.9	62.0	71.5	73.7	64.6	70.2	74.7	68.7
1978	73.9	71.6	76.9	76.5	68.3	75.2	77.6	74.3
1979	80.7	81.0	82.3	83.6	74.9	82.0	82.9	79.6
1980	88.9	89.8	89.0	93.4	84.5	90.2	90.8	88.6
1981	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1982	110.8	107.2	112.5	105.6	114.1	110.6	108.7	115.5
1983	117.2	111.2	120.2	109.8	119.8	118.2	115.8	130.0

Source: Statistics Canada - The Consumer Price Index - Cat No. 62-001

TABLE 6.12

CONSUMER PRICE INDEX AND MAIN COMPONENTS - EDMONTON AND CALGARY 1973 - 1983 (1981 = 100)

	All Items	Food	Housing	Clothing	Transportation	Health and Personal Care	Recreation Education Reading	Tobacco and Alcohol
Edmonton								
1973	47.2	44.5	44.4	52.1	46.4	52.5	55.7	58.3
1974	74.1	73.5	74.4	73.6	71.2	77.1	77.7	78.1
1975	80.7	82.0	80.5	81.5	77.1	82.5	84.2	81.1
1976	88.9	90.1	87.9	92.8	86.0	89.6	91.4	88.5
1981	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1982	110.8	107.7	112.7	105.7	112.1	114.3	108.1	116.1
1983	117.2	111.5	118.8	109.1	119.2	122.7	116.1	134.0
Calgary								
1973	47.2	44.9	44.3	52.9	46.1	51.2	55.6	55.6
1974	73.6	73.1	73.0	74.9	70.4	77.5	78.9	75.6
1975	73.6	73.1	73.0	74.9	70.4	77.5	78.9	75.6
1976	80.0	82.4	78.7	82.6	75.4	84.1	84.1	79.6
1980	88.3	90.4	86.7	92.1	85.2	89.4	91.4	87.9
1981	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1982	112.0	106.9	116.1	104.4	113.5	114.3	109.1	114.1
1983	117.1	109.7	119.8	105.6	120.0	124.1	116.7	131.2

Source: Statistics Canada, *Consumer Price Index*, 1984, Table 10-01.

TABLE 6.13

CONSUMER PRICE INDEX FOR REGIONAL CITIES - CANADA - 1971 - 1983 (1981 = 100)

	St. John's	Halifax	Saint John	Quebec	Montreal	Ottawa	Toronto	Thunder Bay	Winnipeg	Regina	Saskatoon	Edmonton	Calgary	Vancouver
1971	39.3	43.1	41.9	42.8	42.7	43.2	42.5	42.7	42.4	42.7	43.4	41.9	42.3	41.8
1972	41.6	45.2	44.3	44.4	44.6	45.3	44.6	44.6	44.4	44.6	45.4	43.8	44.2	44.1
1973	45.6	48.8	48.0	47.9	47.8	48.9	48.1	47.9	47.4	47.6	48.3	47.2	47.2	47.3
1974	51.5	53.6	53.0	53.3	53.2	54.2	53.2	53.1	52.4	52.1	52.8	52.1	51.9	52.8
1975	57.4	59.0	59.1	58.8	59.0	59.4	58.9	59.1	58.9	57.6	58.8	57.7	57.8	58.6
1976	61.9	63.9	63.3	62.7	63.0	63.9	63.2	64.3	63.9	62.7	63.6	62.3	62.7	64.3
1977	66.6	68.9	68.0	68.2	68.2	69.1	68.1	69.3	69.1	68.8	69.0	68.0	68.0	68.9
1978	71.9	74.2	73.5	73.7	71.9	74.9	73.9	74.9	75.0	75.0	74.4	74.1	73.6	74.3
1979	79.0	80.8	80.4	80.5	80.6	81.6	80.7	81.5	81.8	81.3	81.0	80.7	80.0	80.0
1980	88.2	89.4	88.7	89.2	89.0	89.4	88.9	89.5	90.0	89.5	89.5	88.9	88.3	87.5
1981	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1982	110.0	109.6	109.4	112.2	111.6	109.9	111.3	110.4	108.8	109.0	109.0	110.8	112.0	110.5
1983	117.5	116.8	116.8	118.3	117.8	117.3	118.0	117.1	116.1	116.0	115.9	117.2	117.1	116.6

Source: Statistics Canada, *Consumer Price Index*, 1984, Table 10-01.

impact on everyone. For example, the changes in the housing price index, measure only the effects on the renters and home buyers; relatively unaffected are the home owners who have clear title to their residences.

The consumer price index measures the effect of ordinary price changes on typical ordinary citizens. Strictly speaking it is not valid to apply it to specific industries. For example, steel products industry costs may change at radically different rates from those of the chemical or wood products industries, due to

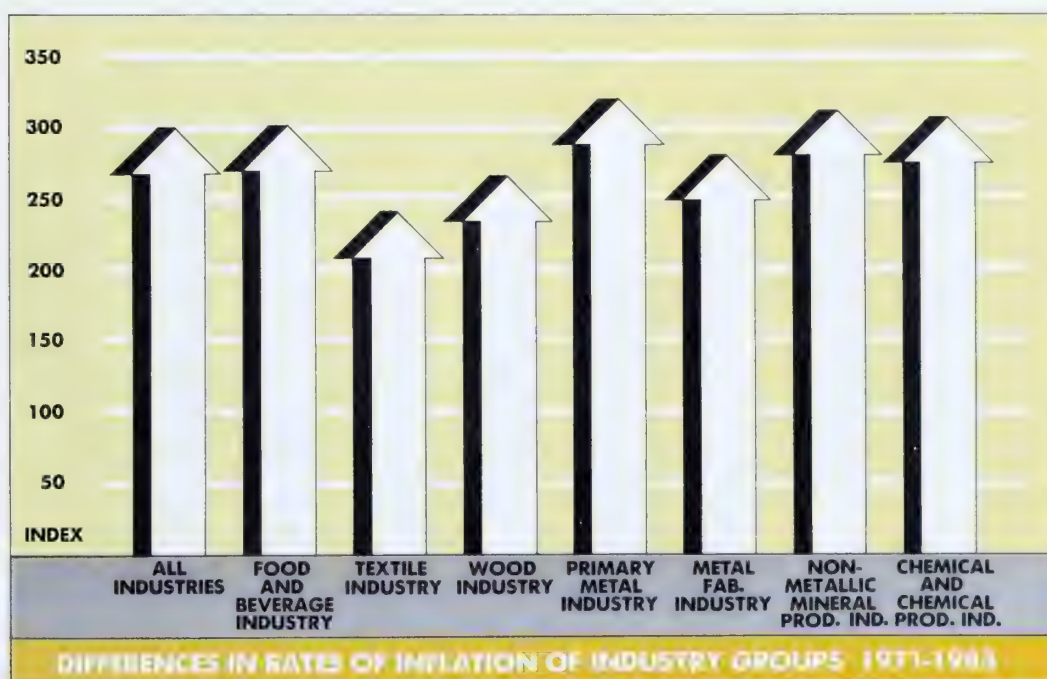
completely different national or international competitive and cost factors. In very general terms, some of the disparities in industry incidence may be observed in the Industry Selling Price Indexes table.

TABLE 6 14

**INDUSTRY SELLING
PRICE INDEXES BY
MAJOR GROUPS,
INDUSTRIES AND
SELECTED
COMMODITIES —
CANADA — 1971-
1983 (1971 = 100)**

Year	Total	Food & Bev. Ind.	Textile Ind.	Wood Ind.	Primary Metal Ind.	Metal Fab. Ind.	Non- Metallic Mineral Prod. Ind.	Chem. & Chem. Prod. Ind.
1971	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1972	104.4	108.7	99.3	122.2	102.2	104.7	104.1	101.4
1973	116.1	131.3	109.2	151.9	117.5	112.8	109.0	106.5
1974	138.1	155.0	131.1	149.1	147.7	135.1	124.9	137.1
1975	153.7	170.9	132.5	151.3	160.8	152.3	147.3	160.3
1976	161.6	173.7	142.5	167.9	169.9	162.3	163.2	167.2
1977	174.3	185.9	150.4	188.7	190.5	172.2	177.6	175.9
1978	190.4	205.6	159.7	225.3	207.8	188.2	192.3	189.3
1979	217.9	231.7	180.7	260.3	258.8	211.5	210.0	214.9
1980	247.2	256.6	203.9	244.6	308.3	232.7	235.0	251.6
1981	272.4	279.4	228.1	245.4	312.6	256.0	270.7	286.4
1982	288.8	294.4	236.3	238.6	310.7	277.8	305.3	306.9
1983	298.8	304.8	240.3	264.8	320.9	283.9	319.2	316.6

Source Statistics Canada, Industry Price Indexes Cat. No. 62-011





International Trade

International Trade

*Government of
Alberta's International
Trade Pavilion - seen
at International Trade
Shows in Canada
and around the world*

From its early historical period, Alberta has been an exporter of the goods it produced. Furs were the first prominent commodities of exchange. With the arrival of the settlers, wheat, barley, coal and lumber, were exported as production exceeded local demand. After the major discoveries of oil and natural gas in 1947, Alberta became a supplier of energy for the rest of Canada. Through the process of development, and with the modernization of transportation and the growing interdependence of world markets, more and more Alberta goods began to make their way into the international market.

Commodities related to the energy and agriculture sectors are Alberta's biggest export earners. The prosperity that resulted from the development of the economy has brought about a fundamental structural change. Resource processing and manufacturing have,

increasingly, become an integral part of the economy. Exports reflect this change. In 1975, only 15.7 per cent of Alberta exports had a value-added component: by 1983, exports of value added goods (finished and semi-finished products) have outpaced the growth of total overall exports, including that of crude petroleum and natural gas. Between 1975 and 1983, total exports increased from \$4.5 billion to \$9.2 billion, an annual compound increase of 9.4 per cent: exports of goods with value added, experienced a compounded growth rate of 16.6 per cent over the same eight year period.

The compilation of Canadian export data is done by Statistics Canada, the statistical branch of the federal government. Statistics Canada's primary source of information is the data provided by Canada Customs. While the data are accurate at the federal level, they were not designed to provide provincial export information. In order to present a better assessment of Alberta foreign trade,

TABLE 7.1

**EXPORTS BY
COMMODITY
GROUP - ALBERTA
1975-1983
(MILLIONS OF
DOLLARS)**

	1975	1976	1977	1978	1979	1980	1981	1982*	1983*
Live Animals	14.9	22.9	27.3	45.1	32.7	43.8	49.8	57.5	59.1
Food, Feed, Beverages	57.2	68.6	84.2	97.7	104.3	137.3	138.9	1,724.0	1,692.5
Crude Materials, inedible	3,811.1	3,630.2	3,441.0	3,469.8	4,682.2	6,151.3	6,566.3	7,104.4	6,880.7
Fabricated Materials, inedible	509.0	534.2	732.9	852.8	1,153.4	1,329.7	1,665.4	1,680.3	1,962.1
End Products, inedible	110.3	76.9	87.6	96.5	151.4	227.3	607.1	453.2	277.8
Special Transactions, Trade	11.3	13.7	5.6	8.8	19.8	82.5	96.4	97.0	36.3
Invisible Exports	N/E	N/E	N/E	N/E	N/E	N/E	429.0	508.1	492.1
TOTAL	4,513.9	4,346.4	4,378.7	4,530.6	6,143.8	7,971.8	9,920.9	11,624.3	11,409.7

N/A = Not Estimated

* = 1982 & 1983 export values of wheat, barley, canola and flaxseed were estimated by Alberta Agriculture and included in the Food, Feed, & Beverages figures; comparable estimates have not yet been made for the period 1975-81.

Source = Statistics Canada: External Trade Division and Alberta Agriculture

estimates were made on certain exports known to be severely understated.

Alberta Agriculture estimates that the grain and oilseed component of exports were understated by approximately \$1.65 billion in 1983. Invisible exports, the provision of services to foreign individuals, accounted for another \$492 million, according to Alberta Economic Development. These estimates were added to the \$9.22 billion export figure of Statistics Canada for an export total of \$11.4 billion. Exports form roughly 22 per cent of the provincial gross domestic product.

In 1983 the resource sector accounted for about 60 per cent of total exports. Exports of natural gas, crude petroleum and coal were dominant and totalled \$6.88 billion. Manufacturing industries producing fabricated materials and end products, formed the next largest sector accounting for about 20 per cent of the total. Fabricated materials include petroleum products (such as gasoline, fuel oil and liquified butane and propane), organic chemicals (petrochemicals), fertilizers and lumber products, and finished goods such as oil and gas field equipment, telecommunications equipment and agricultural machinery.

Food and agricultural products contributed just over 15 per cent of total exports. Included in this category are wheat, barley, canola, livestock and meats.

Alberta exports reach virtually every part of the globe. The United States is by far the largest and most important foreign market. In 1983, 75 per cent of total exports went to the U.S., much of it comprised of natural gas and crude petroleum. The Pacific Rim and Asian markets accounted for 11.5 per cent of exports. Europe, with 8.6 per cent, is third. Latin America, the Middle East and Africa account for the remaining 4.9 per cent.

Japan has consistently been the second largest market for Alberta commodities, followed by the USSR, the People's Republic of China and Brazil. In 1983, exports to the United States, in order of value, were natural gas, crude petroleum, liquified butane and propane gas, petroleum products, wood pulp, anhydrous ammonia and lumber. Japan imported coal, wheat, barley, crude petroleum, milled cereals and petrochemicals. Alberta exported wheat, barley, oil and gas field equipment and sulphur to the USSR, and wheat, barley and sulphur to the People's Republic of China. Exports to Brazil included wheat, sulphur and coal.

TABLE 7.2

**MAJOR FOREIGN
EXPORT
COMMODITIES -
ALBERTA
-1978-1983
(MILLIONS OF
DOLLARS)**

	1978	1979	1980	1981	1982*	1983*
Natural Gas	1,800	2,342	3,411	3,950	4,250	3,614
Crude Petroleum	1,202	1,826	1,890	1,621	1,767	2,258
Wheat	N E	N E	N E	N E	1,111	1,162
Petroleum Products	343	507	594	741	852	960
Coal & Crude Bitumen	301	289	380	367	392	408
Barley	N E	N E	N E	N E	455	367
Sulphur	108	142	349	489	445	353
Organic Chemicals	35	26	89	146	116	267
Woodpulp	150	202	236	256	231	207
Canola	N E	N E	N E	N E	167	152
Fertilizer & Fertilizer Materials	147	166	150	166	165	148
Inorganic Chemicals	54	53	62	89	88	112
Lumber	59	76	66	62	49	104
Meat Products	27	32	42	55	68	71
Livestock	45	35	43	50	58	59
Oil & Gasfield Equipment	28	50	95	405	252	83
Total - Major Commodities	4,299	5,756	7,407	8,397	10,466	10,325
Total Exports	4,531	6,144	7,972	9,921	11,624	11,400

N E = values not estimated for 1978,81 period

* Includes Alberta Agriculture export value estimates for wheat, barley, and canola

Source: Statistics Canada, Export Trade, Annual and Quarterly Reports

TABLE 7.3

**MAJOR FOREIGN
EXPORT MARKETS -
ALBERTA -
1978-1983
(MILLIONS OF
DOLLARS)**

	1978	1979	1980	1981	1982*	1983*
U.S.A.			7,134.0	8,340.6	8,275.9	8,103.1
Japan	286.4	240.7	260.3	302.3	666.9	709.4
U.S.S.R.	2.4	3.2	7.4	13.3	597.0	476.1
People's Republic of China	8.9	11.6	34.4	22.3	235.4	259.8
Brazil	12.2	19.3	49.1	74.1	44.0	152.4
The Netherlands	3.3	15.7	22.9	33.9	92.2	108.9
United Kingdom	21.2	22.8	24.2	43.2	96.1	85.8
German Democratic Republic (East)	.4	.4	.2	.0	.0	76.6
Taiwan	14.9	14.7	37.4	36.7	35.8	66.2
Republic of Korea (South)	21.5	23.3	39.9	39.3	65.4	58.7
Cuba	1.9	4.2	3.3	11.9	8.4	53.1
Italy	8.0	10.8	14.8	26.8	77.3	50.8
Federal Republic of Germany (West)	5.9	25.2	16.7	29.2	32.8	43.7
Belgium/Luxembourg	7.2	11.1	29.1	23.8	38.7	41.9
Iran	0	.3	.1	-	-	38.0
Algeria	.5	2.2	.3	2.6	.5	33.2
Australia	9.2	12.2	34.1	81.8	62.3	33.0
Iraq	0	2.5	.2	.2	.5	32.8
France	5.4	6.6	16.0	20.5	25.6	32.3
Tunisia	3.7	7.2	32.1	44.1	36.6	31.9
Rest of the World	N/	N/	N/	N/	N/	420.8
TOTAL EXPORTS	4,570.6	6,143.7	7,971.8	9,443.5	11,139.4	10,908.5

N/ = Negligible

* = includes Alberta export value estimates for wheat, barley, canola and flaxseed for 1982-1983; no value estimates for those commodities for period 1978-81

Source - Statistics Canada, External Trade Division and Alberta Agriculture

Alberta Agency for International Development

It is through this agency that the Government of Alberta conducts its international assistance program, providing financial assistance in support of development projects and programs in less developed countries.

The largest program of any province in Canada, approximately 500 projects receive assistance each year in about 80 countries. Total assistance provided in 1983-84 was \$7 million and \$10 million in 1984-85.

The program is conducted in co-operation with about 80 Canadian Non-Governmental Organizations (NGOs). These are not-for-profit international development agencies to which the people of Alberta make voluntary financial contributions. An NGO is required to contribute to a project from its privately raised funds an amount at least equal to

the amount it is receiving from the Government of Alberta.

Projects receiving support are normally small scale development activities at the village level and in rural areas of less developed countries. Such projects are usually designed to assist in increasing production (especially food production), increase incomes, create employment and impart new and practical skills to people. Assistance is also provided for projects designed to relieve suffering of people in emergency situations, such as drought and natural calamities.

The program has been in operation for 10 years and in that time has become an integral part of Canada's international assistance community.



The People

People

Plains Indians were the original inhabitants of the territory which is now Alberta. It is assumed that their ancestors crossed the Bering Strait from Asia in prehistoric times. From carbon-dated remains and artifacts it is known that they reached North America at least 20,000 years ago, subsisting as nomadic hunters and trappers.

Fur-trading companies were active in Alberta during the 18th and early 19th centuries but it was the aftermath of the American civil war and heavy European immigration in the 19th century which really stimulated development of the area. Concerned that American settlers and government would take over all of North

America west of the Great Lakes, the federal government of Canada bought out the land grants of the Hudson's Bay Company, established a police force for the area, and assisted financially in the construction of the transcontinental Canadian Pacific Railway. Completed in 1885, the railway brought in settlers and made both necessary and feasible the production and export of commodities other than furs.

The first major tide of immigrants settled in the province during the 1896-1913 period. As a result, population rose from 50,000 to 400,000. A second wave of immigration came during the period 1918-1931, increasing population to 730,000. A third influx, beginning after World War II, continues to the present day. Alberta's population is now over 2,360,000. Official 1981 census data showed that of the current population, approximately 44 per cent are of British descent, 11 per cent German, 6 per cent Ukrainian, 5 per cent French, and about 3 per cent native Indian. Another 8 per cent are of mixed British and other origins; and another 3 per cent are of mixed French and other origins. The balance came from a wide range of countries. There are no significant geographic concentrations of ethnic groups, although that of Slavic groups is proportionately heavier to the north and east of Edmonton.

In 1981 over 54 per cent of Albertans were native born and an additional 17 per cent were born in western Canada. These proportions may have been modified slightly by the heavy interprovincial

*Climbing Mount
Temple in Banff
National Park*

*Heritage Day Festival,
Edmonton.*



Alberta
CANADA

POPULATION DISTRIBUTION 1981

CENTRES OVER 2 500

600 000

400 000

200 000

100 000

50 000

25 000

10 000

5 000

2 500

ONE DOT REPRESENTS 250 PERSONS

Total Population 2 237 724 1981 Canada Census

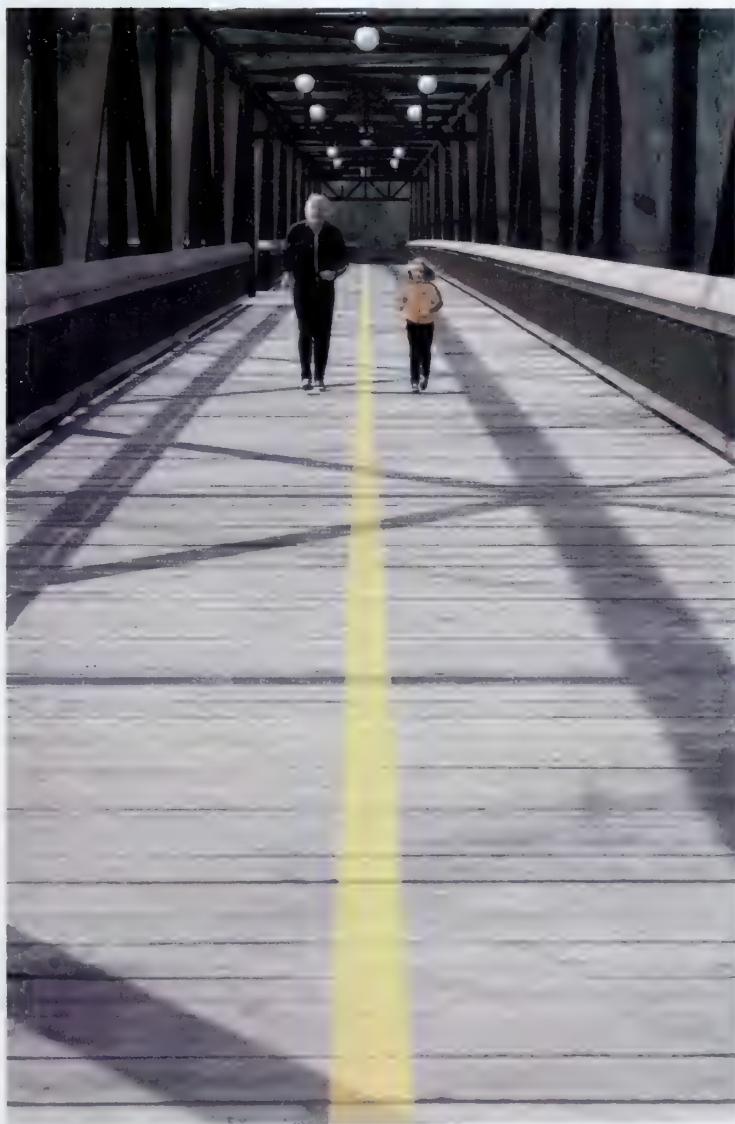
Produced by the Alberta Bureau of Surveying and Mapping © 1983



migration of recent years.

English is the language of the vast majority. Most religious faiths are represented, with United, Roman Catholic, Anglican and Lutheran churches comprising two thirds of the total.

Until the drought and depression of the 1930's, the population distribution in all census divisions in the southern half of the province (below 54 degrees latitude) was remarkably even. This situation was dictated by homesteading opportunities, and the fact that all areas were being tested for suitability for various types of agriculture. Only one-quarter of the population lived in urban communities. Over the next five decades, however, these urban-rural proportions were completely reversed as the industrial-social development of the province proceeded.



Census Data

Alberta's population reached 2,237,724 in 1981, a 21.7 per cent increase since 1976, and almost double that of 25 years earlier. Over the five year intercensal period, population density increased from 2.9 persons to 3.5 persons per square kilometre.

Most of the population increase over the past five years has occurred in urban areas, where an overall growth rate of 24.0 per cent has brought the urban population to 1.7 million persons, 77.2 per cent of the total.

The population of Alberta cities rose by nearly 416,000 during the 1971-81 decade, partly attributable to the number of locations which achieved city status. The combined population of Edmonton and Calgary rose by 34%; the two cities accounted for just over 50 per cent of all people in the province. The population of towns and villages rose by over 122,000 persons.

In 1981, 81 per cent of Alberta's residents, or 1.8 million persons, claimed English as their mother tongue. This represents an increase of 22 per cent over the same figure five years earlier. Alberta's second largest language group, German, reached 91 thousand in number, a 14 per cent increase. Largest relative increases during the five year intercensal period were experienced within the mother tongue groups having the smallest absolute number of members: Spanish, Indo-Pakistani, Semitic, and Armenian - with increases ranging up to 200 per cent.

The population has increased annually for all but a very few (those related to movements during the War) of the last fifty years. Birth rates peaked in the mid-1950's and have been declining ever since. The actual numbers of live births peaked in 1960, then declined steadily for more than a decade; in recent years they have been rising again.

Marriage rates were high during the war and immediate post war years, then declined steadily until the early 1960's. In recent years, they have approached war time levels.

Death rates have been declining fractionally but steadily for most of the past fifty years. This is due partly to improved health care, partly to a tendency for older couples to retire in more equable climates, and partly to the heavy influx in recent years of young people from other parts of Canada.

TABLE 8.1

POPULATION BY
CENSUS DIVISIONS
- ALBERTA 1961,
1971, 1976, 1981

Census Division	1961		1971		1976		1981	
	No.	Percent of Total	No.	Percent of Total	No.	Percent of Total	No.	Percent of Total
1	39,140	2.9	39,140	2.4	46,990	2.6	55,375	2.5
2	83,306	6.3	86,624	5.3	96,995	5.3	110,477	4.9
3	30,967	2.3	30,940	1.9	32,898	1.8	35,652	1.6
4	15,020	1.1	12,991	0.8	12,130	0.7	12,119	0.5
5	38,115	2.9	34,485	2.1	35,424	1.9	38,382	1.7
6	317,989	23.9	447,079	27.5	524,554	28.5	608,680	29.9
7	40,837	3.1	38,334	2.4	37,808	2.1	40,071	1.8
8	76,533	5.7	85,638	5.3	95,384	5.2	123,642	5.5
9	20,274	1.5	19,781	1.2	19,903	1.1	21,670	1.0
10	70,177	5.3	65,532	4.0	67,229	3.7	78,417	3.5
11	410,679	30.8	552,461	33.9	630,876	34.4	762,041	34.1
12	47,310	3.6	54,647	3.4	63,129	3.4	84,221	3.8
13	45,431	3.4	43,786	2.7	48,338	2.5	53,701	2.4
14	19,282	1.4	21,665	1.3	19,386	1.0	24,635	1.1
15	76,884	5.8	94,762	5.8	106,993	5.8	128,639	5.7
Total	1,331,944	100.0	1,627,874	100	1,838,037	100.0	2,237,724	100.0

Source: Census Canada, 1981

TABLE 8.2

POPULATION -
RURAL AND
URBAN,
NUMERICAL AND
PERCENTAGE
DISTRIBUTION -
ALBERTA -
SELECTED YEARS -
1901-1981

Year	Total No.	Rural No.	Percent of Total	Urban No.	Percent of Total
1901	73,022	61,171	83.8	11,851	16.2
1911	374,295	264,359	70.6	109,936	29.4
1921	588,454	411,284	69.9	177,170	30.1
1931	731,605	503,723	68.9	227,882	31.1
1941	796,169	545,564	68.5	250,605	31.5
1951	939,501	509,413	54.2	430,088	45.8
1961	1,331,944	480,368	36.1	851,576	63.9
1966	1,463,203	455,796	31.2	1,007,407	68.8
1971	1,627,875	429,045	26.0	1,198,830	74.0
1976	1,838,037	444,551	24.2	1,393,486	75.8
1981	2,237,724	510,179	22.8	1,727,545	77.2

Source: Census Canada, 1981

TABLE 8.3

POPULATION OF
CITIES, TOWNS
AND VILLAGES
AND PERCENTAGES
OF TOTAL
POPULATION -
ALBERTA -
SELECTED YEARS -
1901-1981

Year	Cities		Towns		Villages	
	No.	%	No.	%	No.	%
1901	4,091	5.60	9,518	13.03	4,924	6.74
1911	90,252	24.11	25,881	6.91	21,529	5.75
1921	147,246	25.02	50,145	8.52	25,513	4.34
1931	94,203	26.54	50,155	6.86	34,150	4.67
1941	215,894	27.12	53,623	6.74	37,069	4.66
1951	342,002	36.40	98,565	10.49	47,621	5.07
1961	636,684	47.80	206,992	15.54	51,223	3.85
1966	829,559	56.69	173,182	11.84	47,970	3.28
1971	975,083	59.90	203,917	12.53	48,613	2.99
1976	1,089,481	59.27	269,827	14.68	49,199	2.68
1981	1,390,825	62.15	325,782	14.56	49,162	2.20

Source: Statistics Canada, 1981

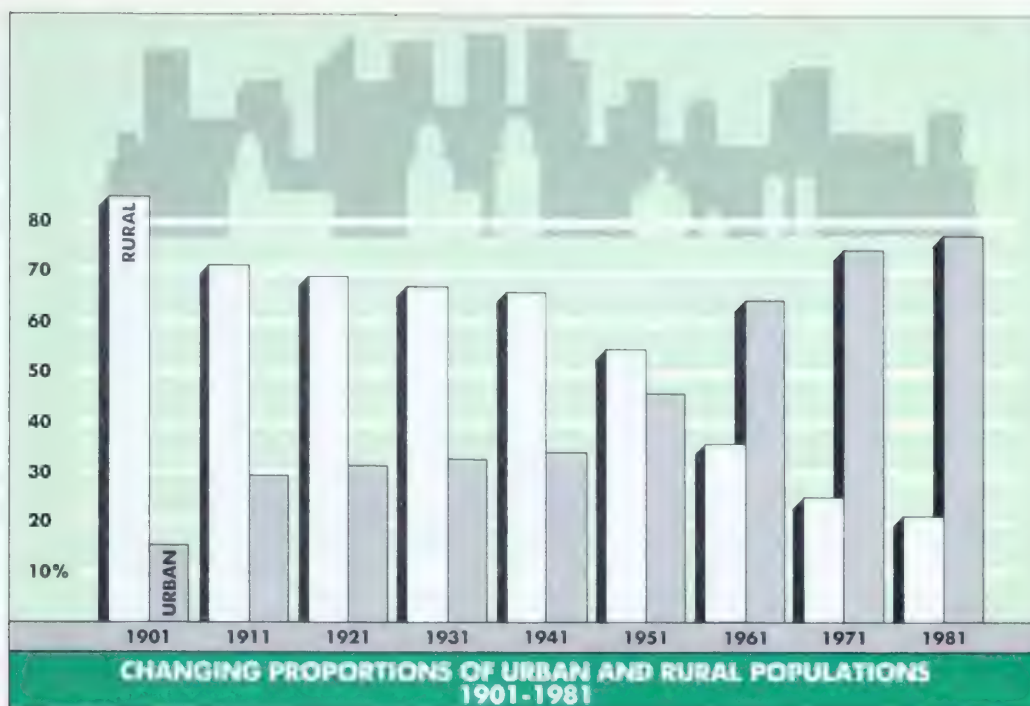


TABLE 8.4

POPULATION OF INCORPORATED CITIES, TOWNS AND VILLAGES - ALBERTA -SELECTED YEARS - 1931-1983

	City (C), Town (T), Village (V), Summer Village (SV)	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Acme	V	5	234	285	275	328	300	351	457	492
Airdrie	T	6	198	191	267	524	1,089	1,414	8,414	10,431
Alberta Beach	SV	13	38	59	79	135	320	432	485	510
Alix	V	8	241	360	461	631	565	673	837	837
Alliance	V	7	260	233	281	291	230	228	208	208
Amisk	V	7	-	-	-	127	134	133	196	212
Andrew	V	10	115	326	625	601	466	486	548	569
Argentia Beach	SV	11	-	-	-	-	2	-	4	3
Arrowwood	V	5	293	251	222	195	166	145	156	165
Athabasca	T	13	573	578	1,068	1,487	1,765	1,823	1,731	1,862
Barnwell	V	2	-	-	-	-	-	158	359	359
Barons	V	2	284	233	369	345	237	283	315	323
Barrhead	T	13	222	399	1,243	2,286	2,803	3,003	3,736	3,736
Bashaw	T	10	385	494	603	614	757	788	875	875
Bassano	T	2	615	582	624	815	861	999	1,200	1,200
Bawlf	V	10	183	227	236	203	182	207	350	351
Beaumont	V	11	-	-	-	-	336	851	2,638	3,202
Beaverlodge	T	15	211	331	514	897	1,157	1,371	1,937	1,937
Beiseker	V	6	230	240	325	360	414	486	580	648
Bellevue	V	9	-	-	-	1,323	1,242	1,186	-	-
Bentley	V	8	233	279	439	588	621	730	823	825
Berwyn	V	15	-	206	288	347	474	444	557	674
Betula Beach	SV	11	-	-	-	7	-	2	-	8
Big Valley	V	7	455	291	307	461	306	344	360	360

Source: Census of Canada 1981

TABLE 8.4

CONTINUED

	City (C), Town (T), Village (V), Summer Village (SV)	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Birchcliff	SV	8							55	43
Bittern Lake	V	10	47	50	25	76	100	91	139	153
Black Diamond	T	6	683	890	1 154	1 243	945	1 252	1 444	1 545
Blackfolds	V	8	84	113	154	477	904	1 065	1 488	1 488
Blackie	V	6	251	223	224	184	168	228	298	343
Blairmore	T	9	1 629	1 731	1 933	1 980	2 037	2 371		
Bon Accord	V	11					332	888	1 376	1 425
Bonnyville	T	12	362	603	1 139	1 736	2 587	2 948	4 454	4 864
Bonnyville Beach	SV	12						7	45	43
Botha	V	7	107	111	98	112	99	133	172	172
Bowden	V	8	233	234	277	437	560	661	989	1 021
Bow Island	T	1	314	291	653	1 122	1 159	1 296	1 491	1 499
Boyle	V	13				346	460	581	638	679
Breton	V	11				428	352	424	552	548
Brooks	T	2	708	888	1 648	2 827	3 986	6 387	9 421	9 421
Bruderheim	V	10	280	237	387	299	350	527	1 136	1 238
Burdett	V	1	121	123	118	229	206	214	220	250
Calgary	C	6	83 761	88 904	129 060	249 641	403 319	471 397	592 743	620 692
Calmar	T	11			944	700	799	880	1 003	1 118
Camrose	C	10	2 258	2 598	4 131	6 939	8 673	10 104	12 570	12 809
Canmore	T	9					1 538	2 405	3 484	3 745
Carbon	V	5	355	409	374	371	343	435	434	438
Cardston	T	3	1 672	1 864	2 487	2 801	2 685	3 263	3 267	3 267
Carmangay	V	5	279	229	285	297	230	263	266	281
Caroline	V	8				321	339	295	436	431
Carstairs	T	6	387	371	468	665	884	1 069	1 587	1 725
Castle Island	SV	13						3	5	5
Castor	T	7	634	625	798	1 025	1 166	1 207	1 123	1 123
Cayley	V	6	127	133	139	146	122	156	194	232
Cereal	V	4	185	142	135	195	220	231	249	252
Champion	V	5	310	320	378	419	335	300	339	380
Chauvin	V	7	269	343	340	395	349	296	298	335
Chestermere Lake	SV	6						210	487	550
Chinook	V	4	176	142	116	114	59	43		
Chipman	V	10	284	240	180	174	181	296	266	281
Claresholm	T	3	1 156	1 265	1 608	2 143	2 935	3 281	3 493	3 493
Clive	V	8	215	224	241	251	247	254	364	364
Cluny	V	5	134	138	202	174	86	95	92	111
Clyde	V	13	186	160	219	259	233	331	364	376
Coaldale	T	2	251	290	806	2 592	2 798	3 667	4 579	4 671
Coalhurst	V	2						473	882	1 119
Cochrane	T	6	293	298	530	857	1 046	1 486	2 544	4 044
Cold Lake	T	12				1 307	1 309	1 372	2 110	2 245
Coleman	T	9	1 704	1 870	1 961	1 713	1 534	1 543		
Consort	V	4	299	265	396	557	659	609	632	632

TABLE 8.4

CONTINUED

	City (C), Town (T), Village (V), Summer Village (SV)	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Coronation	T	7	738	581	738	864	877	1,198	1,309	1,268
Coutts	V	2	-	-	-	469	407	387	400	400
Cowley	V	3	151	125	119	127	201	284	304	304
Cremona	V	6	-	-	-	221	186	314	382	410
Crossfield	V	6	321	409	443	593	638	777	1,217	1,358
Crowsnest Pass	T	9	-	-	-	-	-	7,286	7,306	7,577
Crystal Springs	SV	11	-	-	-	13	8	31	29	44
Czar	V	7	140	139	123	196	196	184	148	184
Daysland	T	7	404	438	475	539	593	623	679	700
Delburne	V	8	193	308	395	450	383	417	574	555
Delia	V	5	286	315	278	287	241	232	211	239
Derwent	V	10	107	171	233	281	203	156	142	142
Devon	T	11	-	-	842	1,418	1,468	2,786	3,885	3,931
Dewberry	V	10	-	-	-	179	160	161	163	181
Didsbury	T	6	801	892	1,180	1,254	1,821	2,158	3,095	3,235
Donalda	V	7	169	206	318	289	232	198	280	266
Donnelly	V	15	-	-	-	289	274	282	336	362
Drayton Valley	T	11	-	-	-	3,854	3,900	4,378	5,042	4,867
Drumheller	C	5	2,987	2,748	2,601	2,931	5,446	6,154	6,508	6,671
Duchess	V	2	114	149	258	218	228	350	429	429
Eaglesham	V	15	-	-	-	-	218	229	208	207
Eckville	T	8	169	135	379	580	660	781	870	842
Edberg	V	10	131	132	188	179	145	140	150	150
Edgerton	V	7	189	258	309	295	296	324	387	389
Edmonton	C	11	79,197	93,817	159,631	281,027	438,152	461,594	532,246	560,085
Edmonton Beach	SV	11	-	-	-	20	148	243	280	329
Edson	T	14	1,547	1,499	1,956	3,198	3,818	4,058	5,835	6,210
Elk Point	T	12	-	307	453	692	729	822	1,022	1,057
Elnora	V	8	153	195	211	214	213	229	249	278
Empress	V	4	314	341	411	405	266	238	200	254
Entwistle	V	11	189	218	-	411	353	384	462	468
Evansburg	V	14	-	-	-	452	528	671	779	784
Fairview	T	15	260	432	929	1,506	2,109	2,273	2,869	2,869
Falher	T	15	253	244	575	741	918	1,123	1,102	1,204
Ferintosh	V	10	161	169	205	174	127	135	155	155
Foremost	V	1	-	-	375	561	568	539	568	576
Forestburg	V	7	291	231	443	677	669	808	924	955
Fort Assiniboine	V	13	-	-	-	216	173	187	207	217
Fort Macleod	T	3	1,447	1,912	1,860	2,490	2,715	3,067	3,139	3,139
Fort McMurray	C	12	-	-	926	1,186	6,847	15,424	31,000	34,494
Fort Saskatchewan	T	11	1,001	903	1,076	2,972	5,726	8,430	12,169	12,474
Fox Creek	T	15	-	-	-	-	1,281	1,625	1,978	1,978
Frank	V	9	268	204	239	223	224	201	-	-
Gadsby	V	7	144	141	128	98	47	43	47	56
Galahad	V	7	150	145	198	231	179	184	152	175

TABLE 8.4

CONTINUED

	City C Town T Village V Summer Village SV	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Gibbons	T	11	-	-	-	192	551	1 118	2 276	2 592
Girouxville	V	15	-	-	-	3 4	347	352	373	373
Gleichen	T	5	514	435	430	426	367	339	381	381
Glendon	V	12	-	-	-	315	354	370	430	455
Glenwood	V	3	-	-	-	274	200	199	259	266
Golden Days	SV	11	-	-	-	-	19	10	30	37
Grand Centre	T	12	-	-	-	1 493	2 088	2 800	3 146	3 119
Grande Cache	T	15	-	-	-	-	2 525	4 116	4 523	4 624
Grande Prairie	C	15	1 464	1 724	2 664	8 352	13 079	17 626	24 263	24 076
Grandview	SV	11	-	-	-	-	16	21	31	36
Granum	T	3	329	238	327	290	324	413	399	399
Grassy Lake	V	2	-	-	167	274	196	151	201	211
Grimshaw	T	15	137	169	564	1 095	1 714	1 679	2 316	2 488
Gull Lake	SV	8	-	21	32	40	57	92	80	80
Hairy Hill	V	10	-	-	205	173	99	96	72	72
Halfmoon Bay	SV	8	-	-	-	-	-	14	33	34
Halkirk	V	7	160	118	148	172	136	152	156	156
Hanna	T	4	1 490	1 622	2 027	2 645	2 545	2 622	2 806	2 996
Hardisty	T	7	428	457	536	582	594	540	641	680
Hay Lakes	V	10	125	154	231	233	211	242	302	318
Heisler	V	7	125	-	-	214	199	200	212	212
High Level	T	15	-	-	-	-	1 614	1 562	2 194	2 673
High Prairie	T	15	-	-	1 141	1 756	2 354	2 364	2 506	2 580
High River	T	6	1 459	1 430	1 888	2 276	2 676	3 612	4 792	5 049
Hill Spring	V	3	-	-	-	243	213	175	200	220
Hines Creek	V	15	-	-	-	398	438	503	575	529
Hinton	T	14	-	-	-	3 529	4 911	6 731	8 342	8 825
Holden	V	10	230	361	504	556	448	408	430	430
Hughenden	V	7	191	164	218	294	267	236	267	251
Hussar	V	5	151	116	120	213	170	177	175	179
Hythe	V	15	278	247	342	449	487	477	639	681
Innisfail	T	8	1 024	1 223	1 417	2 270	2 474	2 994	5 247	5 444
Innisfree	V	10	227	253	287	291	252	265	255	255
Irma	V	7	196	273	369	425	423	432	474	474
Irricana	V	6	161	172	180	167	139	264	558	726
Irvine	T	1	234	240	224	240	194	221	360	360
Island Lake	SV	13	-	-	-	12	20	45	43	43
Itaska Beach	SV	11	-	-	-	2	-	2	8	6
Kapisiwin	SV	11	-	-	-	2	-	3	22	4
Killam	T	7	326	347	465	552	851	904	1 005	1 005
Kinuso	V	15	-	-	238	323	267	305	285	285
Kitscoty	V	10	280	234	235	236	320	397	497	545
Lac La Biche	T	12	313	517	905	1 314	1 791	1 993	2 007	2 069
Lacombe	T	8	1 259	1 603	2 277	3 029	3 436	4 034	5 591	5 954
Lakeview	SV	11	-	-	-	15	12	8	9	13

TABLE 8.4

CONTINUED

	City (C), Town (T), Village (V), Summer Village (SV)	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Lamont	T	10	507	438	637	705	899	1 049	1,563	1,673
Lavoy	V	10	151	178	122	131	114	115	122	134
Leduc	C	11	900	871	1,842	2,356	4,000	8,594	12,471	12,471
Legal	V	11	350	462	523	524	563	874	1,022	1,042
Lethbridge	C	2	13,489	14,612	22,947	35,454	41,217	47,286	54,072	58,086
Linden	V	5	-	-	-	-	226	301	407	461
Lloydminster (part)	C	10	539	572	1,706	2,944	4,738	5,818	8,997	9,197
Lomond	V	5	176	129	153	244	165	182	180	204
Longview	V	6	-	-	-	-	189	198	301	291
Lougheed	V	7	218	195	186	217	217	213	226	261
Magrath	T	3	1,224	1,207	1,320	1,338	1,215	1,315	1,576	1,576
Ma-Me-O-Beach	SV	11	-	-	98	142	89	87	82	82
Manning	T	15	-	-	-	896	1,071	1,058	1,173	1,262
Mannville	V	10	307	396	528	632	646	681	788	788
Marwayne	V	10	-	-	-	379	351	372	500	500
Mayerthorpe	T	13	159	217	472	663	1,036	1,022	1,475	1,475
McLennan	T	15	-	-	1,074	1,078	1,090	1,133	1,125	1,176
Medicine Hat	C	1	10,300	10,571	16,364	24,484	26,518	32,838	40,380	41,167
Mewatha Beach	SV	13	-	-	-	-	-	-	27	27
Milk River	T	2	350	335	481	801	775	817	894	894
Millet	T	11	300	325	402	403	456	762	1,120	1,087
Milo	V	5	135	129	141	167	117	89	100	117
Minburn	V	10	119	129	186	164	106	128	146	146
Mirror	V	8	534	570	635	577	365	335	507	552
Morinville	T	11	570	580	892	935	1,475	2,105	4,657	5,109
Morrin	V	5	149	216	226	316	197	230	244	245
Mundare	T	10	832	756	596	603	511	557	604	655
Munson	V	5	164	139	78	82	54	96	148	148
Myrnam	V	10	131	216	388	441	403	426	397	397
Nakamun Park	SV	13	-	-	-	-	3	9	7	7
Nampa	V	15	-	-	-	271	283	286	334	334
Nanton	T	3	739	718	934	1,054	991	1,158	1,641	1,671
New Norway	V	10	142	169	258	263	200	286	291	309
New Sarepta	V	11	-	-	-	184	202	249	417	461
Nobleford	V	2	143	111	255	309	401	417	534	580
Norglenwold	SV	8	-	-	-	-	40	76	86	84
Okotoks	T	6	760	591	767	1,043	1,247	1,815	3,847	4,919
Olds	T	6	1,056	1,337	1,617	2,433	3,376	3,697	4,813	4,888
Onoway	V	13	149	156	189	302	496	444	621	669
Oyen	T	4	401	326	433	780	929	962	975	1,021
Paradise Valley	V	10	-	-	-	-	144	148	177	177
Peace River	T	15	864	873	1,672	2,543	5,039	4,913	5,907	6,043
Pelican Narrows	SV	12	-	-	-	-	-	-	29	35
Penhold	T	8	125	183	174	319	452	773	1,531	1,588
Picture Butte	T	2	-	-	865	978	1,008	1,164	1,404	1,506

TABLE 8.4

CONTINUED

	City C Town T Village V Summer Village SV	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Pincher Creek	T	3	1 024	994	1 456	2 961	3 227	3 479	3 757	3 757
Plamondon	V	12					189	228	259	271
Point Allison	SV	11				6	10	8	2	2
Poplar Bay	SV	11						16	28	38
Ponoka	T	8	836	1 306	2 574	3 938	4 414	4 642	5 221	5 221
Provost	T	7	533	518	676	1 022	1 489	1 532	1 645	1 756
Radway	V	13			184	183	170	190	192	194
Rainbow Lake	T	15					355	434	504	847
Raymond	T	2	1 849	2 089	2 279	2 362	2 156	2 290	2 837	2 837
Redcliff	T	1	1 192	1 111	1 538	2 221	2 255	3 006	3 876	3 814
Red Deer	C	8	2 662	3 448	7 575	19 612	27 674	32 503	46 393	50 257
Redwater	T	13			1 306	1 135	1 287	1 494	1 932	2 197
Rimbey	T	11	304	410	757	1 266	1 450	1 482	1 685	1 848
Rochon Sands	SV	7				28	20	29	39	51
Rockyford	V	5	194	201	246	288	286	276	329	325
Rocky Mtn. House	T	8	646	800	1 147	2 360	2 968	3 680	4 698	4 735
Rosalind	V	10					203	187	197	197
Rosemary	V	2				210	208	273	328	328
Ross Haven	SV	13					21	41	59	59
Rumsey	V	5	83	90	110	123	95	85	87	93
Rycroft	V	15			372	500	461	533	649	649
Ryley	V	10	236	323	406	469	428	432	483	544
St. Albert	C	11	825	697	1 129	4 059	11 800	24 227	31 996	35 032
St. Paul	T	12	938	1 018	1 407	2 823	4 161	4 351	4 884	4 963
Sandy Beach	SV	13				4	22	55	78	78
Sangudo	V	13		173	269	325	363	417	398	424
Seba Beach	SV	11	41	84	103	113	165	126	126	126
Sedgewick	T	7	338	320	485	655	730	825	879	879
Sexsmith	T	15	304	325	331	531	559	770	1 180	1 184
Silver Beach	SV	11				14	27	30	19	27
Silver Sands	SV	13					2	33	58	72
Slave Lake	T	15				468	2 052	3 561	4 506	4 562
Smoky Lake	T	12	366	430	491	626	881	932	1 074	1 165
South View	SV	13					19	35	35	33
Spirit River	T	15	232	276	553	890	1 091	1 020	1 104	1 104
Spruce Grove	T	11	76			465	3 029	6 996	10 326	11 307
Standard	V	5	218	212	237	266	267	305	379	379
Stavely	T	3	303	273	327	349	351	432	504	548
Stettler	T	7	1 219	1 295	2 442	3 638	4 168	4 188	5 136	5 136
Stirling	V	2	376	437	520	468	436	543	688	688
Stony Plain	T	11	497	566	878	1 311	1 770	2 859	4 839	5 291
Strathmore	T	5	523	560	704	924	1 148	1 567	2 986	3 436
Strome	V	7	172	233	276	311	276	277	281	281
Sundance Beach	SV	11					5	20	11	14
Sundre	T	6			337	853	933	1 108	1 742	1 750

TABLE 8.4

CONTINUED

	City (C), Town (T), Village (V), Summer Village (SV)	Census Division	1931	1941	1951	1961	1971	1976	1981	1983
Sunset Beach	SV	13	-	-	-	-	-	8	22	24
Sunset Point	SV	13	-	-	-	14	26	36	51	89
Swan Hills	T	15	-	-	-	643	1,376	2 012	2 497	2 497
Sylvan Lake	T	8	416	805	985	1 381	1 597	1 837	3 779	3 779
Taber	T	2	1,279	1 331	3,042	3 951	4,765	5 300	5 988	5 988
Thorhild	V	13	-	-	248	312	509	539	576	566
Thorsby	V	11	-	-	385	491	595	657	737	737
Three Hills	T	5	581	706	1,026	1,491	1,354	1,569	1,787	2 008
Tilley	V	2	-	193	259	257	270	329	345	362
Tofield	T	10	497	551	692	905	924	1,120	1,504	1 560
Torrington	V	5	-	-	-	-	118	189	189	230
Trochu	T	5	506	480	630	671	739	767	880	880
Turner Valley	T	6	656	676	719	702	766	1,132	1 311	1,337
Two Hills	T	10	149	210	525	826	979	946	1,193	1,330
Val Quentin	SV	13	-	-	-	-	41	35	99	107
Valleyview	T	15	-	-	-	1,077	1,708	1,716	2,061	2,232
Vauxhall	T	2	-	-	393	942	1,016	954	1,049	1,076
Vegreville	T	10	1,659	1,696	2,223	2,908	3,691	4,209	5,251	5,251
Vermilion	T	10	1,270	1,408	1,982	2,449	2,915	3,208	3,766	3,745
Veteran	V	4	180	190	206	239	267	279	314	318
Viking	T	10	492	491	683	1,043	1,178	1,226	1 232	1,238
Vilna	V	12	151	311	378	400	303	348	345	345
Vulcan	T	5	803	732	1,040	1,310	1,384	1 450	1,489	1,507
Wabamun	V	11	-	-	-	-	-	-	662	705
Wainwright	T	7	1,147	980	1,996	3,351	3,872	3,895	4,266	4,477
Wanham	V	15	-	-	-	251	268	225	266	266
Warburg	V	11	-	-	-	285	464	436	501	552
Warner	V	2	342	296	422	472	408	434	477	482
Warspite	V	12	-	-	-	153	110	92	96	96
Waskatenau	V	12	-	237	239	305	233	271	290	281
Wembley	T	15	183	188	251	303	348	507	1,169	1,209
West Cove	SV	13	-	-	-	-	9	39	49	46
Westlock	T	13	536	590	1,111	1,838	3,246	3,726	4,424	4,432
Wetaskiwin	C	11	2,125	2,318	3,824	5,300	6,267	6,766	9,597	10,022
Whitcourt	T	14	-	-	-	1,054	3,202	3,878	5,585	5,408
Whitesands	SV	7	-	-	-	-	-	-	2	2
Wildwood	V	14	-	-	405	479	386	360	441	450
Willingdon	V	10	250	420	281	429	325	308	366	376
Yellowstone	SV	13	-	-	-	-	14	49	68	73
Youngstown	V	4	372	188	352	321	305	272	297	297

Note: Effective January 1, 1979, Bellevue, Blairmore, Coleman and Frank were amalgamated into the new municipality of Crowsnest Pass.

Source: 1983 data are from municipalities; see other data from Statistics Canada.

TABLE 8.5

POPULATION FOR
CENSUS
DIVISIONS, URBAN
SIZE GROUPS AND
RURAL ALBERTA
-1981

	Total	Urban						Rural Total
		Total	500,000 and Over	30,000 to 99,999	10,000 to 29,999	5,000 to 9,999	2,500 to 4,999	1,000 to 2,499
	2 237 724	1 727 545	1 188 300	175 723	80 677	104 401	119 376	59 068
CD 1	55 375	45 749		44 258				1 491
CD 2	110 475	78 301		54 172		11 419	7 416	1 404
CD 3	35 665	16 564					13 347	3 217
CD 4	12 115	2 806					2 806	
CD 5	38 382	12 770				6 508	2 986	3 276
CD 6	668 682	627 309	592 743			8 414	23 068	6 084
CD 7	40 071	13 479				5 136	4 264	4 077
CD 8	123 642	74 102		46 393		16 059	8 477	3 173
CD 9	21 670	15 553					10 961	4 592
CD 10	78 417	33 320			21 567	5 251	3 766	2 736
CD 11	762 041	662 632	595 557		34 847	14 639	13 381	4 208
CD 12	84 221	51 774		31 000		7 319	9 338	4 117
CD 13	53 701	16 948				5 582	8 160	3 206
CD 14	24 635	14 177				14 177		
CD 15	128 639	62 061			24 263	5 907	14 404	17 487

Source: Statistics Canada, 1982

TABLE 8.6

POPULATION BY
MOTHER TONGUE,
BY CENSUS
DIVISIONS AND
CITIES OVER
10,000 - ALBERTA
-1981

	Total	English	French	German	Indian & Eskimo	Italian	Nether- lands & Flemish	Polish	Ukrain- ian	Other
CD 1	55,375	45,395	645	6,845	15	120	365	140	190	1,210
CD 2	110,475	89,815	970	7,225	335	650	2,865	810	440	6,570
CD 3	35,665	28,335	290	2,075	3,435	45	495	80	30	765
CD 4	12,115	10,610	75	255	5	13	30	80	45	210
CD 5	38,380	32,220	400	2,780	1,085	90	395	80	350	970
CD 6	668,680	560,545	13,820	20,790	1,180	6,940	6,175	2,865	7,400	48,930
CD 7	40,070	35,470	505	2,275	15	25	170	105	430	1,075
CD 8	123,642	110,275	1,690	3,185	1,870	170	1,445	210	990	3,845
CD 9	21,670	17,110	530	570	1,205	400	165	275	330	1,385
CD 10	78,415	60,175	905	3,125	320	55	330	625	1,030	2,570
CD 11	762,040	598,330	24,730	29,755	3,095	7,340	7,325	6,045	13,585	52,195
CD 12	84,220	61,600	7,640	17,020	5,260	105	295	535	5,470	2,365
CD 13	53,700	42,960	1,585	2,910	470	45	525	610	3,385	1,110
CD 14	24,635	21,055	880	790	275	70	200	75	710	580
CD 15	128,640	97,225	1,470	2,175	9,310	110	1,615	590	1,070	3,095
Alberta	2,237,725	1,810,545	62,145	91,480	27,560	16,180	21,990	13,065	68,130	126,630
Calgary	592,745	492,125	13,075	17,895	720	6,680	5,370	2,670	7,300	47,160
Edmonton	532,245	432,560	13,210	19,515	660	3,930	5,075	5,095	27,160	47,040
Grande Prairie	24,265	20,895	865	695	75	50	135	145	450	805
Lethbridge	54,075	44,590	560	2,010	130	530	910	585	960	3,830
Medicine Hat	40,380	33,100	495	4,270	5	105	235	115	325	1,025
Red Deer	46,395	41,865	790	1,000	35	85	485	50	430	1,650
St. Albert	31,995	27,170	520	840	40	85	380	145	660	1,150

Source: Statistics Canada, 1982

Other: non-South Slavic

TABLE 8.7

**POPULATION BY
RELIGIOUS
DENOMINATION
FOR CENSUS
DIVISIONS -
ALBERTA - 1981**

Census Division	Total	Catholic	United Church Anglican	Other Protestant	Eastern Orthodox	Jewish	No Preference	Eastern Non-Christian	Other
1	54,730	15 080	12 865	4 045	17 405	275	125	4 745	10
2	109,365	25 625	25 355	7 085	39 595	800	170	8 725	95
3	35,050	7 220	7 650	2 840	14 730	80	5	2 390	15
4	11,885	1 870	5 280	905	3 070	85	10	660	5
5	37,520	7 525	11,255	3,670	11 800	115	5	3 015	35
6	662,520	164 725	160,350	74 455	141 385	7 425	5 710	90 925	840
7	39,585	8,510	15 010	2 595	10 570	120	35	2 615	25
8	120,615	21,380	35,520	10,240	38 665	400	105	13 645	141
9	21,475	6 545	5 600	2 645	2 825	340	70	3 300	30
10	76,870	22 005	20 060	5 110	18 680	5 580	25	5 180	20
11	755,045	229,780	164 145	64 075	155 105	25 915	4 290	94 255	1 040
12	83,810	37,695	15 345	7,355	11 820	4 135	20	6 355	125
13	53,010	14 695	15,355	3,875	11 640	2 005	0	5 330	20
14	24,550	6,520	6 435	2,265	5,135	590	20	3 460	25
15	127,635	44 740	25,270	11,115	29,810	1 420	75	14,475	125
TTL.	2,213,650	613,930	525,480	202,265	512,255	49,275	10,650	259,065	2,535

TABLE 8.8

**POPULATION BY
ETHNIC ORIGIN
FOR CENSUS
DIVISION -
ALBERTA - 1981**

Census Division	Total	British	French	Dutch (Netherlands)	German	Italian	Native Peoples	Polish	Scandinavian	Ukrainian	Other Single Origins	Multiple Origins
1	54,730	20,755	1,600	1,755	17 120	305	205	565	1,775	995	3,090	6 565
2	109,360	46,085	2,520	7,240	15,405	1 225	1,190	1,955	4,545	2 975	13 455	12 770
3	35,055	16 655	775	1,840	3,925	85	4,320	280	1,425	560	1,705	3 490
4	11,885	6 135	180	255	2 430	25	30	215	705	275	435	1,195
5	37,520	17,380	1,205	1,220	5,875	235	2,095	470	2 120	875	2,260	3,790
6	662,520	328 730	26 660	16 585	56 960	11,800	6 055	8,015	19,015	19 690	87 325	81 690
7	39,585	19,760	1,190	1,010	6 845	55	150	600	3 135	1 240	1,830	3,770
8	120,620	62,940	4,190	4,785	12 770	450	3 690	1 165	6,285	3,335	7,155	13 860
9	21,475	10,365	1,150	500	1,525	915	185	680	480	810	1 980	2 880
10	76,865	28 430	2,190	1 455	8 935	115	720	2 165	6 105	14 460	3 635	8 655
11	755,045	296 465	43,620	20,605	73,630	10,405	13 035	15,950	22,935	69 030	89 385	99 985
12	83,805	30,305	10,760	1,130	3,220	270	11,175	1,595	1,590	9 095	5,245	9 425
13	53,005	20,235	3,275	2,035	7 380	215	1,395	1,660	1,990	5,375	2 680	6 765
14	24,550	10 860	1,805	700	2 460	125	625	395	1,080	1,365	1,595	3,540
15	127,635	47,685	10 750	3,955	14,695	380	15,135	1 955	5,375	6 625	6,705	14 370
Total	2,213,650	962,785	111,865	65,060	233,180	26,605	60,005	37,660	78,560	136,710	228,480	272,735

TABLE 8.9

POPULATION 15 YEARS AND OVER BY SCHOOL ATTENDANCE, SHOWING HIGHEST LEVEL OF SCHOOLING - ALBERTA 1981

	Population 15 Years and Over	Not Attending School	Attending School Full-time	Attending School Part-time
Elementary-Secondary School Only	978,620	843,210	111,640	23,770
Less than Grade 5	37,845	37,745	5	100
Grades 5-8	174,795	169,030	4,410	1,355
Grades 9-13	532,675	430,080	90,820	11,775
Secondary (High) School Graduation Certificate	184,780	161,360	15,350	8,075
Trade Certificate or Diploma	48,520	45,005	1,060	2,455
Other Non-University Education Only	385,805	317,580	29,505	38,715
Without Non-University Certificate or Diploma	111,820	82,665	15,780	13,375
With Non-University or Trades Certificate or Diploma	273,985	234,910	13,730	25,345
University	308,195	224,880	44,690	38,625
Without University or Other Non-University Certificate, Diploma or Degree	78,460	46,020	24,645	7,795
With Non-University or Trades Certificate or Diploma	42,725	31,185	4,705	6,835
With University Certificate or Diploma Below Bachelor Level	27,015	22,350	1,530	3,135
With Bachelor's Degree	114,510	88,085	10,885	15,545
With University Certificate or Diploma Above Bachelor Level	13,595	11,005	605	1,985
With Medical Degree	6,000	5,105	555	340
With Masters Degree	20,300	16,090	1,650	2,565
With Earned Doctorate	5,595	5,045	170	385

Source: Census Canada (1981)

TABLE 8.10

POPULATION BY SPECIFIED AGE GROUPS IN CENSUS DIVISIONS - ALBERTA - 1981

	Age Groups											
	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-69	70+	Total
CD 1	4 685	4 345	4 370	5 245	5 885	9 455	5 730	5 050	5 005	2 015	3 590	55 375
CD 2	9 745	9 145	9 225	10 890	11 250	18 325	11 645	10 035	9 000	3 775	7 415	110 450
CD 3	3 515	8 515	3 350	3 685	3 005	5 065	3 570	3 070	2 955	1 350	2 565	35 645
CD 4	1 070	930	1 045	1 195	1 060	1 830	1 200	1 200	1 340	400	840	12 110
CD 5	3 350	3 255	3 440	3 680	3 230	6 135	4 160	3 530	3 570	1 495	2 530	38 375
CD 6	51 410	46 895	49 260	61 040	87 775	144 525	81 060	62 035	42 865	14 845	26 980	668 690
CD 7	3 405	3 225	3 415	4 080	3 400	5 845	4 115	3 875	3 940	1 685	3 090	40 075
CD 8	10 815	9 950	10 140	12 440	14 195	22 140	13 620	10 890	9 215	3 590	6 645	123 640
CD 9	1 570	1 420	1 375	1 875	3 020	4 740	2 210	1 980	1 675	665	1 145	21 675
CD 10	6 435	6 050	6 610	7 590	6 580	11 640	8 230	7 465	7 390	3 505	6 920	78 415
CD 11	62 075	56 975	58 710	72 440	95 215	154 290	91 240	70 455	50 890	17 815	31 940	762 045
CD 12	8 860	8 600	8 625	8 705	8 965	15 895	9 855	6 125	4 205	1 505	2 885	84 225
CD 13	4 640	4 500	5 030	5 255	4 340	8 280	5 845	5 475	4 790	1 855	3 690	53 700
CD 14	2 455	2 280	2 325	2 515	2 610	4 655	2 820	2 195	1 415	490	870	24 630
CD 15	13 930	13 065	12 645	13 790	13 800	22 720	14 015	10 360	7 045	2 420	4 875	128 665
Total												
Alberta	187 960	174 190	179 565	214 425	264 330	435 540	259 315	203 740	155 300	57 410	105 980	2 237 715

Source: Census Canada (1981)

TABLE 8.11

**FAMILIES BY
NUMBER OF
PERSONS FOR
CENSUS DIVISIONS
AND
MUNICIPALITIES
OF 5,000
POPULATION AND
OVER — ALBERTA
-1981**

	Families by Number of Persons								Families	
	2	3	4	5	6	7	8+	Number	No. of Persons in:	Average No. of Persons in:
CD 1	5,910	3,065	3,535	1,545	430	120	50	14,650	46,730	3.2
CD 2	10,885	5,565	6,525	3,145	1,230	390	270	28,010	92,760	3.3
CD 3	3,100	1,615	1,780	1,055	495	200	155	8,395	29,110	3.5
CD 4	1,105	640	685	390	135	35	15	3,005	9,995	3.3
CD 5	3,610	1,875	2,290	1,165	420	100	75	9,530	31,675	3.3
CD 6	68,130	37,125	41,485	16,855	4,760	1,060	455	169,860	537,655	3.2
CD 7	3,955	2,005	2,480	1,245	430	115	50	10,280	33,895	3.3
CD 8	11,995	6,740	7,695	3,570	1,080	275	165	31,520	102,685	3.3
CD 9	2,280	1,060	1,165	455	120	35	15	5,145	15,835	3.1
CD 10	7,985	4,020	4,740	2,325	875	205	95	20,245	66,080	3.3
CD 11	73,900	42,925	48,045	20,800	6,370	1,380	610	194,035	625,860	3.2
CD 12	6,075	4,260	5,240	2,700	1,105	390	355	20,125	71,940	3.6
CD 13	5,145	2,820	3,355	1,670	630	180	85	13,885	46,270	3.3
CD 14	1,995	1,335	1,685	835	255	60	45	6,210	21,265	3.4
CD 15	9,435	6,360	7,745	4,260	1,690	580	680	30,750	110,685	3.6
Total Alberta	215,505	121,415	138,445	62,005	20,020	5,115	3,125	565,635	1,842,435	3.3
Airdrie	770	610	725	230	45	5	5	2,395	7,765	3.2
Brooks	875	495	645	250	80	20	10	2,365	7,700	3.3
Calgary	61,195	33,020	35,940	14,370	4,030	910	385	149,840	470,800	3.1
Camrose	1,415	695	740	295	85	15	10	3,260	10,070	3.1
Crowsnest Pass	795	390	500	185	50	15	10	1,945	6,175	3.2
Drayton Valley	430	305	340	155	35	10	—	1,280	4,205	3.3
Drumheller	745	300	325	160	45	5	5	1,585	4,820	3.0
Edmonton	57,005	30,490	29,460	12,475	3,855	865	300	134,540	418,165	3.1
Edson	495	310	395	190	50	10	—	1,450	4,865	3.3
Fort McMurray	2,125	1,760	2,200	990	340	85	45	7,540	26,265	3.5
Fort Saskatchewan	880	650	1,020	430	115	15	10	3,120	10,800	3.5
Grande Prairie	2,185	1,315	1,555	675	210	40	15	5,990	19,535	3.3
Hinton	625	465	655	290	75	20	10	2,135	7,345	3.4
Innisfail	490	335	345	165	30	10	5	1,380	4,485	3.2
Lacombe	685	280	330	160	60	10	5	1,445	4,645	3.2
Leduc	980	705	985	400	135	20	5	3,225	10,990	3.4
Lethbridge	6,230	2,930	3,260	1,315	450	100	50	14,330	44,665	3.1
Lloydminster (Alta. Pt.)	820	490	560	235	75	20	5	2,200	7,120	3.2
Medicine Hat	4,720	2,270	2,475	1,020	285	70	30	10,880	33,755	3.1
Peace River	485	320	385	180	65	15	5	1,450	4,880	3.4
Ponoka	685	260	310	120	30	5	—	1,410	4,205	3.0
Red Deer	4,665	2,575	2,750	1,115	285	55	30	11,470	35,950	3.1
Spruce Grove	680	615	950	375	100	20	5	2,740	9,635	3.5
St. Albert	2,005	1,815	2,840	1,200	340	65	30	8,285	29,515	3.6
Stettler	620	255	300	130	40	10	5	1,355	4,165	3.1
Taber	620	315	335	165	75	30	10	1,550	5,110	3.3
Vegreville	690	255	260	135	45	10	5	1,400	4,255	3.0
Wetaskiwin	1,090	490	575	240	85	10	5	2,495	7,795	3.1
Whitecourt	420	325	425	150	50	10	—	1,390	4,695	3.4

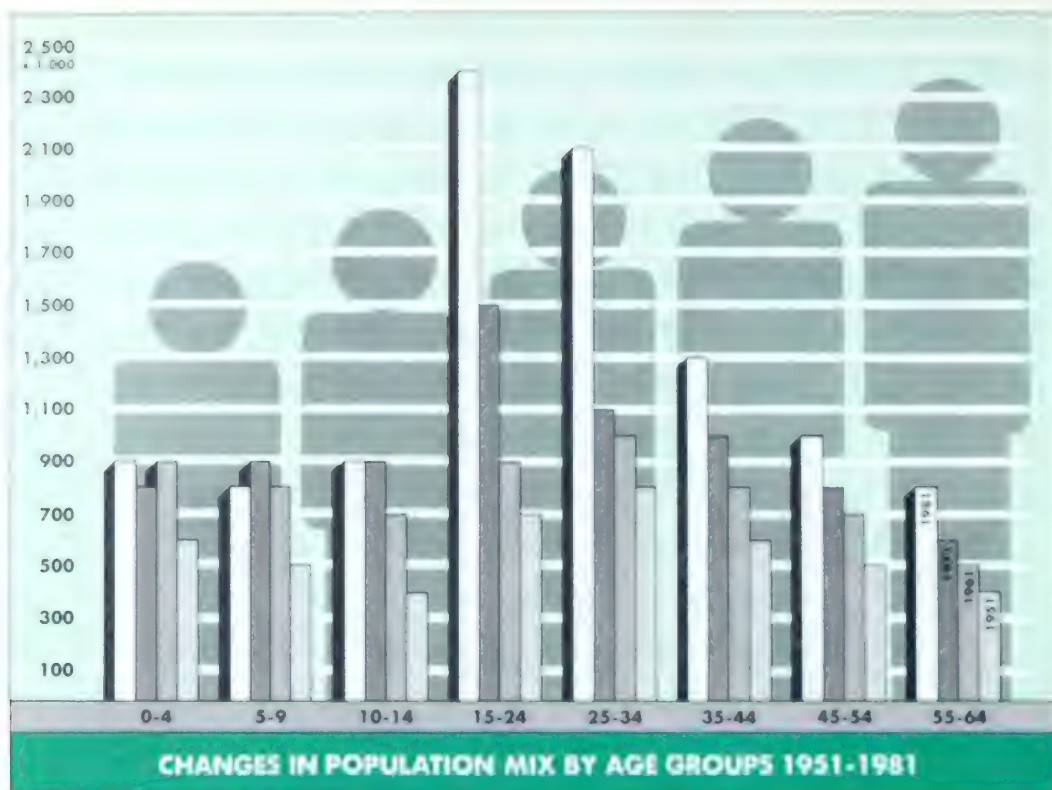


TABLE 8.12

FAMILIES BY
FAMILY
STRUCTURE, FOR
CENSUS DIVISIONS
- ALBERTA - 1981

	Total Families	Husband- Wife Families	Lone Parent Families			Total Families		
			Total	Male Parent	Female Parent	With Children at Home	With All Children At Home 18 Years and Over	With All Children At Home 17 Years and Under
CD 1	14 650	13 520	1 130	180	950	9 355	1 275	6 925
CD 2	28 010	25 450	2 555	430	2 130	18 485	2 610	13 270
CD 3	8 395	7 465	930	170	760	5 690	785	4 140
CD 4	3 010	2 795	205	45	160	2 340	335	1 455
CD 5	9 530	8 790	740	170	570	6 310	890	4 595
CD 6	169 865	151 835	18 030	3 045	14 980	111 335	16 750	80 165
CD 7	10 280	9 555	725	160	565	6 710	920	4 890
CD 8	31 520	28 560	2 955	535	2 420	21 030	2 565	15 905
CD 9	5 145	4 660	480	125	355	3 120	440	2 295
CD 10	20 240	18 685	1 555	340	1 215	13 510	1 930	9 490
CD 11	194 030	172 645	21 385	3 465	17 925	131 365	18 475	94 175
CD 12	20 120	18 320	1 805	470	1 340	14 890	1 255	11 765
CD 13	13 880	12 795	1 085	270	815	9 320	1 225	6 980
CD 14	6 210	5 710	500	120	380	4 500	460	3 560
CD 15	30 750	27 920	2 830	705	2 120	22 695	2 230	17 520
Alberta	565,635	508,705	56,905	10,230	46,685	379,995	53,645	277,130

TABLE 8.13

**PRIVATE
HOUSEHOLDS BY
NUMBER OF
PERSONS FOR
CENSUS DIVISIONS
AND
MUNICIPALITIES
OF 5,000
POPULATION AND
OVER — ALBERTA
-1981**

	Households by Number of Persons						Households		
	1	2	3	4	5	6+	Number	No. of Persons in:	Average No. of Persons in:
CD 1	3,780	6,105	3,275	3,630	1,645	760	19,195	53,480	2.8
CD 2	7,120	11,285	5,960	6,705	3,355	2,270	36,705	106,370	2.9
CD 3	2,175	2,990	1,620	1,765	1,105	1,060	10,715	33,230	3.1
CD 4	850	1,145	675	690	405	215	3,985	11,365	2.9
CD 5	2,365	3,685	1,945	2,310	1,225	740	12,275	35,890	2.9
CD 6	46,605	72,950	42,215	43,665	19,625	9,645	234,705	645,700	2.8
CD 7	2,610	4,020	2,125	2,545	1,300	700	13,295	38,220	2.9
CD 8	7,325	12,345	7,395	7,960	3,875	2,015	40,915	118,875	2.9
CD 9	1,825	2,560	1,225	1,270	555	310	7,740	20,545	2.7
CD 10	5,205	8,165	4,290	4,830	2,465	1,430	26,390	75,360	2.9
CD 11	53,850	77,925	47,120	49,690	23,535	12,175	264,295	746,685	2.8
CD 12	3,450	5,895	4,340	5,340	3,000	2,480	24,510	82,115	3.4
CD 13	3,155	5,140	2,925	3,360	1,820	1,150	17,545	52,315	3.0
CD 14	1,215	2,020	1,430	1,735	895	500	7,790	24,250	3.1
CD 15	5,855	9,415	6,695	7,800	4,640	3,775	38,175	125,955	3.3
Total Alberta	147,390	225,635	133,240	143,295	69,450	39,235	58,240	2,179,350	2.9
Airdrie	170	760	615	760	250	80	2,635	8,335	3.2
Brooks	510	955	580	680	275	140	3,135	9,160	2.9
Calgary	43,480	66,030	37,980	38,095	16,900	8,345	210,830	580,650	2.8
Camrose	1,055	1,495	750	775	320	140	4,530	11,895	2.6
Crowsnest Pass	605	825	390	515	205	95	2,625	7,135	2.7
Drayton Valley	270	475	330	340	185	70	1,675	4,945	3.0
Drumheller	605	795	330	330	175	70	2,305	5,820	2.5
Edmonton	47,150	61,345	34,405	31,095	14,570	7,925	196,495	521,935	2.7
Edson	300	540	340	415	215	90	1,905	5,715	3.0
Fort McMurray	1,145	2,110	1,835	2,275	1,205	710	9,275	30,630	3.3
Fort Saskatchewan	405	890	675	1,020	480	170	3,635	11,750	3.2
Grande Prairie	1,295	2,330	1,550	1,605	815	390	7,990	23,645	3.0
Hinton	305	635	515	660	305	150	2,570	8,255	3.2
Innisfail	370	515	355	355	185	55	1,830	5,145	2.8
Lacombe	435	610	315	325	180	95	1,955	5,400	2.8
Leduc	430	980	720	1,005	440	210	3,790	12,120	3.2
Lethbridge	4,450	6,550	3,165	3,385	1,430	780	19,760	52,770	2.7
Lloydminster (Alta. Pt.)	565	920	555	600	275	120	3,040	8,625	2.8
Medicine Hat	3,180	4,930	2,460	2,555	1,105	500	14,730	39,390	2.7
Peace River	365	510	340	395	195	110	1,925	5,705	3.0
Ponoka	495	720	290	310	140	50	2,005	5,050	2.5
Red Deer	3,255	5,060	3,025	2,910	1,270	525	16,050	43,850	2.7
Spruce Grove	175	680	630	960	385	165	2,990	10,230	3.4
St. Albert	595	1,985	1,840	2,885	1,265	555	9,125	31,500	3.5
Stettler	430	640	280	320	135	65	1,870	4,910	2.6
Taber	420	615	360	355	185	125	2,050	5,880	2.9
Vegreville	525	705	280	270	135	75	1,995	5,020	2.5
Wetaskiwin	775	1,125	545	550	285	145	3,430	9,210	2.7
Whitecourt	280	435	365	430	180	100	1,790	5,510	3.1

Source: Statistics Canada, 1981.

TABLE 8.14

OCCUPIED PRIVATE DWELLINGS BY TENURE, SHOWING STRUCTURAL TYPE, FOR CENSUS DIVISIONS - ALBERTA - 1981

Tenure		Total Occupied Private Dwellings	Single Detached	Apartment Five or More Stories	Other Multiple Dwellings	Double House	Row House	Duplex	Apartment Less Than Five Stories	House Attached To a Non-Res. Building	Movable Dwellings
CD 1	Owned -	18,485	12,475	0	34	22	40	70	45	25	500
	Rented -	1,775	775	275	3,500	280	480	200	2,200	25	155
CD 2	Owned -	21,840	22,840	18	1,095	520	45	10	105	15	1,615
	Rented -	11,145	4,105	650	6,010	1,100	320	705	3,205	50	330
CD 3	Owned -	8,080	7,310	0	25	35	5	30	25	45	50
	Rented -	7,635	1,635	15	810	100	10	90	480	40	80
CD 4	Owned -	3,090	2,715	0	30	0	0	5	5	10	55
	Rented -	890	625	0	15	25	20	40	90	15	65
CD 5	Owned -	9,010	7,900	0	145	60	10	35	5	80	400
	Rented -	3,265	2,090	5	915	10	95	85	600	40	255
CD 6	Owned -	129,560	116,150	860	18,425	6,960	6,970	1,820	1,500	80	4,125
	Rented -	95,145	18,625	16,440	69,600	6,590	12,010	7,870	32,960	2,100	455
CD 7	Owned -	10,410	8,925	0	135	20	20	20	20	50	1,150
	Rented -	2,890	1,710	0	980	70	275	80	510	45	100
CD 8	Owned -	27,610	22,265	15	1,335	690	280	200	95	50	2,000
	Rented -	13,300	4,125	410	8,180	740	1,185	670	1,500	70	585
CD 9	Owned -	4,530	3,610	0	190	60	175	85	45	20	120
	Rented -	3,210	1,255	15	1,805	165	270	230	1,100	45	135
CD 10	Owned -	20,285	18,135	5	360	120	30	65	45	100	1,150
	Rented -	6,110	2,840	40	3,005	255	400	235	2,665	50	200
CD 11	Owned -	154,190	121,820	1,130	14,695	3,610	7,935	430	1,565	150	6,150
	Rented -	109,100	21,870	16,925	70,525	3,620	14,110	3,340	49,180	270	720
CD 12	Owned -	15,965	12,195	5	1,045	505	365	85	30	50	2,120
	Rented -	8,545	2,445	340	5,040	1,135	1,070	270	2,525	35	720
CD 13	Owned -	13,950	11,325	0	210	65	25	30	30	10	2,420
	Rented -	3,595	1,780	15	1,440	125	115	145	1,010	50	360
CD 14	Owned -	5,625	4,395	0	195	50	80	30	20	20	100
	Rented -	2,170	765	25	1,180	50	125	90	695	15	95
CD 15	Owned -	26,865	20,815	0	490	165	105	85	75	10	2,150
	Rented -	11,310	4,920	115	5,080	480	840	440	3,250	70	1,000
Alberta Owned -		478,215	402,570	2,025	39,020	13,120	16,175	5,175	3,710	835	34,600
Rented -		280,030	70,775	35,275	168,130	14,450	32,615	14,570	105,455	1,040	5,855

Source: Census of Canada, 1981

TABLE 8.15

POPULATION BY PLACE OF BIRTH, BY CENSUS DIVISIONS - ALBERTA - 1981

Census Division	Total Pop.	Born in Canada	Born in Alberta	Born in Other Prov.	Born Outside Canada	United States	Central & South America	United King.	Other Europe	Asia	Other
1	54,730	48,360	30,420	17,945	6,365	1,270	50	1,420	3,025	425	180
2	109,365	90,475	65,685	24,795	18,885	3,525	380	3,215	9,600	1,780	380
3	35,050	31,520	26,275	5,240	3,530	1,120	5	785	1,285	245	90
4	11,885	10,935	8,690	2,245	945	370	5	145	380	40	10
5	37,520	33,475	26,285	7,195	4,040	1,315	50	965	1,410	135	165
6	662,520	527,530	282,190	245,340	134,990	13,460	3,355	34,200	46,015	26,240	11,725
7	39,585	35,810	28,595	7,210	3,775	1,215	20	975	1,290	210	60
8	120,620	107,875	75,065	32,805	12,745	2,785	85	3,425	4,900	1,125	430
9	21,470	17,560	10,105	7,455	3,915	470	25	1,180	1,825	290	115
10	76,870	69,725	51,250	18,475	7,145	1,440	25	1,595	3,430	490	165
11	755,040	615,250	408,420	206,835	139,785	11,750	4,140	28,140	57,020	28,615	10,120
12	83,810	74,965	45,845	29,125	8,840	1,055	200	2,130	3,360	1,450	640
13	53,005	46,855	37,860	8,995	6,150	1,165	15	1,205	3,485	215	65
14	24,550	21,895	14,040	7,860	2,655	495	15	535	1,400	105	95
15	127,635	116,590	84,965	31,625	11,045	2,385	390	2,525	4,230	1,095	420
Total	2,213,655	1,848,825	1,195,685	653,140	364,825	43,820	8,755	82,450	142,670	62,460	24,675

Source: Census of Canada, 1981

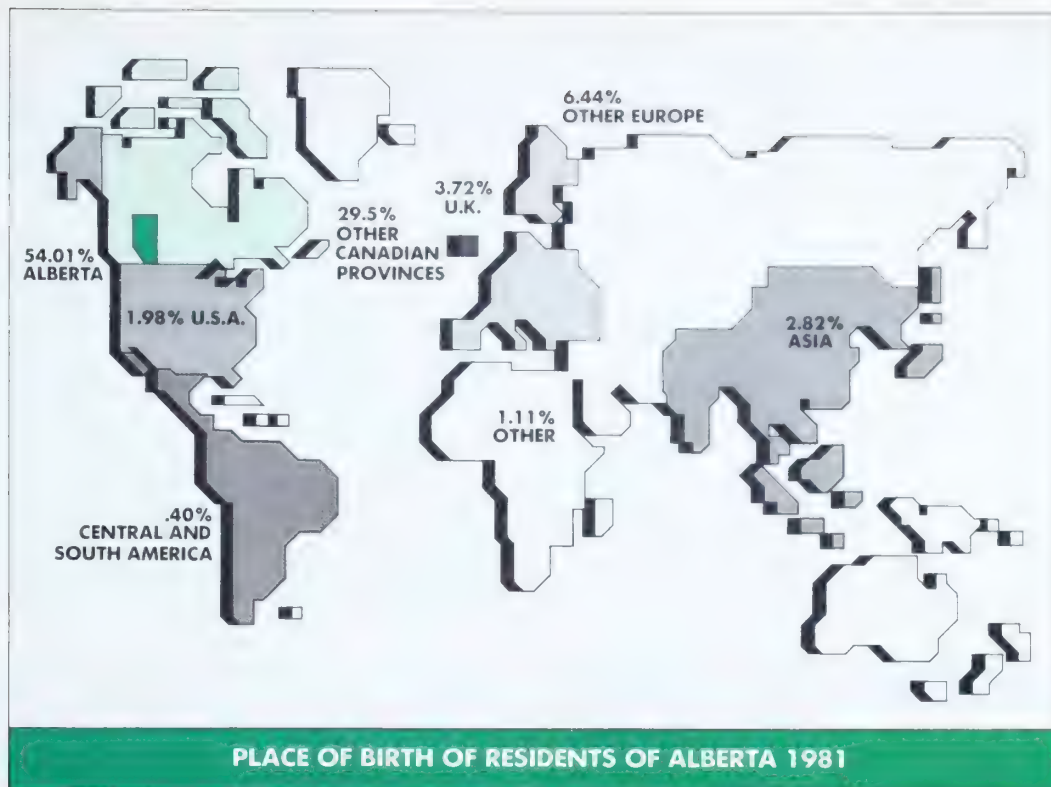


TABLE 8.16

**MOVEMENT OF
ALBERTA
POPULATION 5
YEARS OF AGE
AND OVER 1976-
1981, BY CENSUS
DIVISION**

Census Division	Population 5 Years and Over	Non- Movers	Movers					
			Total	From Different Alberta C.D.	From Different Province	From Outside Canada	To Different Alberta C.D.	To Different Province
1	50,005	22,105	27,900	5,910	6,440	740	4,760	2,680
2	99,545	47,265	52,285	10,720	9,710	2,440	10,595	4,430
3	31,525	16,870	14,655	4,300	2,020	425	4,590	1,210
4	10,795	6,555	4,240	1,435	810	85	1,945	310
5	34,160	18,520	15,640	5,670	2,230	405	5,735	1,570
6	610,660	215,585	395,075	33,130	136,030	32,235	38,355	50,165
7	36,155	20,440	15,710	4,505	2,615	445	5,620	1,395
8	109,750	41,855	67,895	17,695	15,545	2,105	10,100	4,885
9	19,895	8,070	11,820	2,375	4,370	615	3,750	3,165
10	70,395	36,530	33,865	11,645	6,375	820	8,560	2,520
11	692,635	270,520	422,115	42,810	108,075	29,440	49,145	49,855
12	74,730	25,805	48,930	9,425	19,650	2,535	9,720	7,315
13	48,345	24,090	24,255	9,615	3,660	635	7,190	1,665
14	22,080	7,820	14,260	3,810	4,165	395	2,955	1,845
15	113,660	47,965	65,695	12,455	15,140	2,155	12,475	6,170
Alberta	2,024,345	810,005	1,214,340	—	336,825	75,485	—	139,180

Source: Census of Canada, 1981

TABLE 8.17

COMPONENTS OF
INTERNATIONAL
AND
INTERPROVINCIAL
MIGRATION -
ALBERTA -
1969-70 TO
1981-82

Year	International Migration			Interprovincial Migration			Total Net Migration
	Immigration	Emigration	Net	In	Out	Net	
1969-70	11,454	3,700	7,754	63,160	54,357	8,803	16,677
1970-71	9,778	3,100	6,678	59,503	52,598	6,905	13,583
1971-72	8,235	4,900	3,335	61,181	57,600	3,581	6,916
1972-73	8,985	4,600	4,385	62,749	57,185	5,564	9,949
1973-74	13,373	6,200	7,173	72,082	69,487	2,595	9,408
1974-75	15,427	5,800	9,627	79,884	57,309	22,575	32,202
1975-76	15,651	4,800	10,851	76,210	51,588	24,622	35,473
1976-77	13,897	7,084	6,813	81,332	48,622	32,710	41,523
1977-78	12,062	7,874	4,188	83,270	50,727	32,543	36,731
1978-79	8,880	7,475	1,405	86,057	52,631	33,426	34,831
1979-80	16,108	6,010	10,098	100,710	59,275	41,435	51,533
1980-81	18,837	5,569	13,268	109,383	65,133	44,250	57,518
1981-82	20,571	6,698	14,311	100,046	63,484	36,562	50,873

Source: Census Canada, Census of Canada

TABLE 8.18

MIGRATION OF
PERSONS BETWEEN
ALBERTA AND
OTHER PROVINCES
- SPECIFIED
PERIODS -
1961-1982

From Alberta To Years	New- found- land	Prince Edward Island	Nova Scotia	New Brun- swick	Quebec	Ontario	Manitoba	Sask- atche- wan	British Columbia	Yukon & N.W.T.	Total
1961-66	1,201	598	3,568	2,315	9,335	44,390	21,364	40,153	101,370	4,944	232,047
1966-71	1,100	679	4,487	2,591	8,410	47,894	21,684	38,813	124,329	8,456	257,446
1971-76	2,020	1,101	7,153	4,003	8,665	51,559	24,110	45,841	106,413	11,000	293,535
1971-72	560	227	1,281	714	1,821	11,759	4,290	7,146	27,899	1,509	57,606
1972-73	310	222	1,616	775	1,624	9,412	4,414	7,245	29,756	2,406	57,185
1973-74	461	183	1,442	806	2,140	13,197	6,332	13,964	33,502	1,800	69,847
1974-75	311	245	1,568	856	1,532	8,703	4,415	13,667	26,541	2,469	57,309
1975-76	378	223	1,344	850	1,520	9,412	4,699	9,400	21,263	1,865	51,588
1976-77	352	274	1,129	791	1,488	9,543	3,955	8,603	18,793	1,694	46,622
1977-78	572	370	1,799	809	1,460	11,286	3,917	7,654	21,181	1,660	50,727
1978-79	810	342	1,728	923	1,658	11,300	3,284	7,296	24,076	1,407	52,631
1979-80	1,021	275	1,659	956	1,605	10,958	3,582	7,216	30,400	1,331	59,275
1980-81	1,193	298	2,155	1,294	1,984	13,054	4,355	8,020	37,481	1,297	65,133
1981-82	1,463	418	2,860	1,869	2,535	14,530	5,126	8,388	23,053	1,300	63,484
To Alberta From Years											
1961-66	1,422	885	4,447	3,560	9,601	43,049	27,439	40,581	74,334	6,942	230,063
1966-71	1,880	1,076	6,016	4,713	15,165	49,339	35,185	75,448	97,119	7,514	289,452
1971-76	3,017	1,638	7,985	5,273	16,218	75,536	39,877	71,281	120,300	11,000	352,103
1971-72	321	259	1,366	900	2,582	13,741	5,956	11,990	19,140	1,698	61,181
1972-73	338	270	1,285	833	2,940	13,793	7,507	15,457	20,369	2,005	62,749
1973-74	820	347	531	1,044	3,188	14,970	8,240	16,884	27,784	2,200	72,082
1974-75	795	413	1,899	1,236	3,560	17,909	9,091	13,243	26,243	2,500	79,884
1975-76	742	417	1,903	1,249	3,824	19,111	8,067	4,793	26,778	2,000	76,210
1976-77	1,473	521	3,364	1,711	5,629	22,419	7,815	9,632	20,799	2,096	81,332
1977-78	2,488	503	4,220	2,034	8,066	24,136	7,340	10,594	20,884	2,593	83,270
1978-79	2,180	462	3,270	2,276	5,271	20,171	9,055	11,006	31,198	2,631	86,057
1979-80	2,782	712	4,130	3,332	7,197	20,009	10,932	11,630	20,679	2,000	100,710
1980-81	3,362	1,129	5,030	4,460	8,048	43,584	9,773	12,219	19,093	1,771	109,383
1981-82	4,567	1,152	4,699	4,000	9,135	34,070	8,804	10,622	22,064	1,883	100,046

Source: Census Canada, Census of Canada

TABLE 8.19

**POPULATION,
BIRTHS,
MARRIAGES,
DEATHS, AND
RATES - ALBERTA
-1937-1983**

Year	Population	Births	Birth Rate Per 1,000 Population	No. of Marriages	Marriage Rate Per 1,000 Population	No. of Deaths	Death Rate Per 1,000 Population	Rate of Natural Increase Per 1,000 Population
1937	776,000	15,903	20.5	6,345	8.2	6,261	8.1	12.4
1938	781,000	15,891	20.3	6,973	8.9	5,871	7.5	12.8
1939	786,000	16,470	21.0	7,838	10.0	5,789	7.4	13.6
1940	790,000	17,359	22.0	8,782	11.1	6,203	7.9	14.1
1941	796,000	17,308	21.7	8,470	10.6	6,385	8.0	13.7
1942	776,000	18,317	23.6	9,034	11.6	6,091	7.8	15.8
1943	785,000	19,290	24.6	7,771	9.9	6,524	8.3	16.3
1944	808,000	19,372	24.0	7,299	9.0	6,320	7.8	16.2
1945	808,000	19,939	24.7	7,310	9.0	6,454	8.0	16.7
1946	803,000	22,184	27.6	9,478	11.8	6,601	8.2	19.4
1947	825,000	24,631	29.9	8,797	10.7	6,543	7.9	22.0
1948	854,000	24,075	28.2	8,844	10.4	6,987	8.2	20.0
1949	885,000	24,935	28.2	9,037	10.2	7,083	8.0	20.2
1950	913,000	25,625	28.1	9,294	10.2	6,856	7.5	20.6
1951	939,000	27,003	28.8	9,305	9.9	7,167	7.6	21.2
1952	973,000	29,105	29.9	9,514	9.8	7,345	7.5	22.4
1953	1,012,000	31,376	31.0	10,126	10.0	7,646	7.6	23.4
1954	1,057,000	33,593	31.8	9,960	9.4	7,520	7.1	24.7
1955	1,091,000	34,357	31.5	9,844	9.0	7,956	7.3	24.2
1956	1,123,000	34,951	31.1	9,965	8.9	7,786	6.9	24.2
1957	1,164,000	35,718	30.7	10,117	8.7	8,255	7.1	23.6
1958	1,206,000	36,842	30.5	10,186	8.4	8,237	6.8	23.7
1959	1,248,000	38,080	30.5	10,402	8.3	8,481	6.8	23.7
1960	1,291,000	39,009	30.2	10,482	8.1	8,888	6.9	23.3
1961	1,332,000	38,914	29.2	10,474	7.9	8,863	6.7	22.5
1962	1,369,000	38,804	28.3	10,423	7.6	9,264	6.8	21.5
1963	1,403,000	38,467	27.4	10,163	7.2	9,444	6.7	20.7
1964	1,429,000	36,169	25.3	10,634	7.4	9,482	6.6	18.7
1965	1,450,000	32,664	22.5	11,209	7.7	9,534	6.6	15.9
1966	1,463,000	30,592	20.9	11,879	8.1	9,677	6.6	14.3
1967	1,490,000	30,691	20.6	12,903	8.7	9,523	6.4	14.2
1968	1,524,000	30,149	19.8	13,640	8.9	9,963	6.5	13.3
1969	1,559,000	30,855	19.8	14,846	9.5	9,921	6.4	13.4
1970	1,595,000	31,967	20.0	15,285	9.6	10,112	6.3	13.7
1971	1,628,000	30,545	18.8	15,614	9.6	10,525	6.5	12.3
1972	1,657,000	29,282	17.7	16,345	9.9	10,699	6.5	11.2
1973	1,690,000	29,288	17.4	16,280	9.7	10,763	6.4	11.0
1974	1,722,000	29,813	17.4	16,691	9.7	11,252	6.6	10.8
1975	1,778,000	31,624	17.8	17,520	9.9	11,397	6.4	11.4
1976	1,838,000	33,063	18.0	17,752	9.7	11,584	6.3	11.7
1977	1,913,000	34,400	18.0	18,000	9.4	11,600	6.1	11.9
1978	1,983,000	35,396	17.8	18,277	9.2	11,944	6.0	11.8
1979	2,053,000	37,003	18.0	18,999	9.3	12,109	5.9	12.1
1980	2,141,000	39,749	18.6	20,818	9.7	12,710	5.9	12.6
1981	2,237,000	42,638	19.1	21,781	9.7	12,823	5.7	13.3
1982	2,318,000	45,036	19.4	22,312	9.6	12,968	5.6	13.8
1983	2,350,000	45,400	19.3	18,910	8.0	12,130	5.2	14.2

Source: Statistics Canada, Vital Statistics Cat. No's 84-001, 84-204 and 91202

Census Data Definitions

A comprehensive census of Canada and the province is taken during the first year of each decade; the 1986 census will be similar in scope to that of 1981. For practical purposes, it is assumed that socio-economic patterns change so slowly that more frequent censuses cannot be justified.

1. Census divisions are arbitrary but convenient groupings of municipalities. An effort has been made to include municipalities of similar general characteristics in each division.
2. Rural areas include all territory lying outside urban areas. All municipal corporations of less than 1,000 population or of a population density of less than 400 per square kilometre are rural. Corporations are reclassified to urban when they no longer meet the above criteria; they revert to rural when they do.
3. For census purposes, there are no specified criteria for city, town, or village status: some villages may have greater populations than some towns; some towns may be larger than some cities; some hamlets larger than a city, town or village, may be classified rural. Thus, care must be exercised in interpreting the figures.
4. Rural figures are segregated into farm and non-farm in certain tables. Rural farm population includes all persons living in rural areas who are members of the households of farm operators living on their farms for any length of time during the twelve month period prior to the census.
Rural non-farm population includes all persons living in rural areas who are not members of the households of farm operators living on their farms for any length of time during the twelve month period prior to the census.
5. Census family refers to a husband and wife (with or without children who have never married, regardless of age), or a lone parent of any marital status, with one or more children who have never married, regardless of age, living in the same dwelling. For census purposes, persons living in a common-law type of arrangement are considered as now married, regardless of their legal marital status.
6. A private household includes a person, or group of persons not necessarily united by blood ties living together, in one dwelling unit. For census purposes, every person is a member of one and only one household.
7. Mother tongue refers to the first language learned in childhood and still understood by an individual.
8. Ethnic origin refers to the ethnic or cultural group to which the respondent or the respondent's ancestors belonged on first coming to this continent. A person may now have more than one ethnic origin.
9. Mobility status refers to the relationship between a person's usual place of residence on census day and his/her usual place of residence five years earlier.
10. Census metropolitan areas refer to the main labour market areas of urbanized cores having 100,000 or more population. They comprise whole municipalities. Since census metropolitan areas are created by Statistics Canada, they may differ from metropolitan areas designated by local authorities.
11. Urban areas have population concentrations of 1,000 or more, and population densities of 400 or more per square kilometre.
12. Labour force population consists of those persons 15 years of age and over who were employed or unemployed. In a general sense, "employed" is self-explanatory; "unemployed" indicates looking for and available to start work.
13. Participation rate refers to the percentage the total labour force (employed plus unemployed) forms of the population 15 years of age and over in the area or category.
14. Religion refers to specific religious groups or bodies, denominations, sects, cults, or religious communities. Respondents are not necessarily active members of a denomination.
15. Highest level of schooling refers to the highest grade or year of elementary or secondary school attended, or the highest year of university or other non-university completed by persons 15 years of age and over.

16. Census farm refers to any agricultural holding with sales of agricultural products, during the 12-month period prior to the census, of \$250 or more.
17. Dwelling, occupied, private refers to a private dwelling in which a person or a group of persons is permanently residing.

Government

Canada's ten provinces and two territories are linked together by a federal system of government. Under this system, the central and provincial governments each have defined areas of jurisdiction. There are also municipal governments which have responsibility for the provision of many local services within their boundaries.

The division of legislative responsibilities between federal and provincial jurisdictions is set out in the Constitution Act, 1867 (formerly the British North America Act) and subsequent amendments. In 1982, the constitution was patriated from the United Kingdom. The Constitution Act, 1982, provides an amending formula for constitutional change and also contains a Charter of Rights and Freedoms.

Section 91 of the Constitution Act, 1867, lists 29 areas, such as defence and external relations, which fall under exclusive federal jurisdiction. There is also a clause which provides for federal responsibility in all areas not specifically detailed in other sections of the act.

In Section 92 of the Constitution Act, 1867, 16 provincial responsibilities, such as health, property, and civil rights within provincial borders, are listed. Section 92A provides for a regime of legislative competence in the area of natural resources, including provision for exclusive provincial legislative authority for the exploration, development and management of non-renewable natural resources, forestry resources and electrical energy. Section 93 gives the provinces control over education. Section 109 provides that lands, mines, minerals and royalties therefrom belong to provinces. In Section 95, agriculture and immigration are identified as joint federal and provincial responsibilities with the federal government having paramountcy in the event of a conflict of legislation.

Under the provisions of the Constitution Act, 1867, provincial governments are given responsibility to legislate with respect to "municipal institutions in the province". Accordingly, the duties and functions that municipal governments perform are established by provincial statute. In Alberta municipal government structures are set out in the Municipal Government Act which provides for different forms of local self-government based upon local conditions and population.

While municipal government councils are elected they do not operate on a parliamentary model as do the federal and provincial governments. The elected municipal officials (aldermen and a mayor) serve both legislative and executive functions. The civic administration is, therefore, responsible to the entire council for its actions. This serves to involve the elected officials in the process of policy formulation and implementation.

Municipal governments have responsibility for the provision of many local services in Alberta. They provide the protection services of police, fire protection, public health and sanitation; the physical services of roads, streets and bridges; public utilities such as light, water and power; and social services, transportation, and recreational facilities. Local governments also play an important role in planning and designating areas within their boundaries for commercial activities, industrial development, and housing. Local school boards are elected to administer primary and secondary schools within the municipal area.

The Alberta government, like the federal government in Ottawa, has inherited the traditions and practices of British parliamentary democracy. The Legislative Assembly is the body which makes Alberta's laws. This body and an appointed representative of the Sovereign, the Lieutenant-Governor, make up the legislature. The 79 members of the legislative assembly (MLA's) each represent separate constituencies and most belong to political parties. The party which elects the largest number of representatives forms the government, and the next largest party forms the official opposition. If there are other parties with representatives, they too are part of the opposition. When no party has a majority, either a coalition government,

with representatives from more than one party, or a minority government, may be formed. Neither a coalition nor minority government has been formed thus far in Alberta's history.

Elections must be held at least every five years. They are called after dissolution of the legislature by the Lieutenant-Governor upon the recommendation of the Premier. They also take place if the governing party loses the confidence of the legislature through a defeat on a major vote. These election requirements provide the ultimate assurance of democracy in Alberta.

The executive branch of the Alberta government is made up of the Lieutenant-Governor in Council, a body composed of the Lieutenant-Governor, the Premier, and the Cabinet.

As the Sovereign's representative, the Lieutenant-Governor must give assent to all laws passed by the legislature and regulations passed by the cabinet, although this Royal Assent has rarely been refused. Because the Lieutenant-Governor is not elected, he does not have authority comparable to that of the elected representatives. The office contributes to stability and continuity since the tenure of each Lieutenant-Governor usually bridges successive governments' terms.

The primary executive function of government is filled by the Premier, who is the leader of the party with the most seats in the legislature, and Cabinet, all of whom are elected members of the legislature. Cabinet ministers receive their appointments from the Lieutenant-Governor upon the advice of the Premier. The Premier is chairman of the Executive Council or Cabinet. Through laws passed in the legislature, authority for many day-to-day decisions of government is delegated to the Cabinet. Cabinet ministers are responsible to the legislature for the activities of government departments. They also have a major role in recommending legislation to the legislature.

Over the years, Alberta's governments have been conscious of their accountability to the public and of the public's rights in dealing with government. Alberta was the first Canadian province to establish the office of ombudsman. The ombudsman is empowered to review situations and recommend remedial action in cases where members of the public may have been improperly affected by government decisions. The ombudsman is independent

of other government officials and reports directly to the legislature.

Alberta was also the first province to allow regular televising of debates in the legislature. A Hansard (written record of debates) is also published.

Environmental Protection

The government of Alberta recognizes that the province's beautiful natural environment must be protected against the potentially harmful effects of industry. In 1971, the government passed an act establishing the department of environment. The department administers 13 laws which give it authority to prevent and control pollution of air, water and land, manage water resources, conserve land and conduct environmental research.

Environmental standards for common pollutants in Alberta are at least as stringent, and in some cases more so, than in other provinces. Measures to enforce standards are taken even before development begins. Certain industries are required by law to apply to Alberta Environment for a permit before starting construction. The department assesses possible effects on the environment and sets out terms and conditions, such as plant design and pollution control, in the permit.

When an application is approved the department issues an operating licence. The licence sets limits on the amounts of pollutants that can be emitted and specifies monitoring requirements. Licensed operators must report their monitoring data regularly to the department.

The Alberta government has achieved a high degree of compliance with environmental standards through the process of negotiation. However, if the cooperative approach does not clear up an environmental problem the offender may be subject to the full range of enforcement methods such as directives, control and stop orders and even prosecution.

Companies wishing to develop may be asked to submit an environmental impact assessment to the department. The purpose of an EIA is to describe possible effects of a project on the environment and ways of either avoiding or reducing them. Proponents will often keep local residents informed about the project and consider their views when preparing an EIA.

When land is disturbed by a new project the operator must agree to restore it to its original use once the activity has ceased or the plant closes down. In the past, many parcels of land used as garbage dumps, mines, sand or gravel pits and the like were simply abandoned. Now, with money from the Heritage Savings Trust Fund, derelict sites are being reclaimed for productive use. In fact Alberta is in the forefront of research to return disturbed land to its former state.

Alberta Environment also administers about 13 restricted development areas around cities. The RDAs as they are known include environmentally sensitive land and transportation and utility corridors.

One of Alberta's most pressing environmental problems -- the estimated 90,000 tonnes of hazardous wastes produced annually - is nearing a solution. Early in 1984 the department of environment announced that a location for hazardous waste treatment plant had been found about 200 km north-west of Edmonton near Swan Hills. The plant will be built and operated by a private company and is expected to become fully operational in 1987.

On April 1, 1984 the government established the Alberta Special Waste Management Corporation to make sure that hazardous wastes are properly treated and disposed of and to oversee operations of the treatment plant.

Recycling is the other side of waste management. Alberta Environment promotes recycling of glass, paper and other re-usable materials by giving technical information and grants to municipalities and community groups and by encouraging the public to collect and return recyclable items.

For example, the department helped establish a network of about 300 used lube oil collection centres in major centres and has assisted various groups to set up paper collection depots. Alberta is the only province with a beverage container return system. More than 200 depots are licensed by Alberta Environment to accept glass, plastic and aluminum beverage containers.

Many other environmental concerns have been the subjects of scientific research in recent years. The Alberta Environmental Centre in Vegreville carries out applied research for the department of environment and for other government departments and agencies. Other scientists are commissioned by the department to find new techniques for reclaiming land, to evaluate the environmental effects of oil sands developments and so on.

In 1983, the department of environment and the petroleum and utilities industries embarked on a unique research program to determine the effects of acid rain on the environment and on human health. The \$8 million acid deposition research program will take at least six years to achieve its ambitious objectives.

The department also manages the province's ground and surface water, making sure there is enough good quality water to meet major foreseeable needs. Some services provided by the department are river flow forecasting (used to predict floods and drought), design, construction, operation and maintenance of structures such as dams and weirs, river basin planning and granting of permits and licences for the use of water.

Flood and erosion control projects throughout Alberta are partially funded by Alberta Environment. Major projects in the next few years will be construction of the Oldman Dam near Lethbridge and improvements to irrigation headworks and canals.

Alberta Environment administers the following legislation: The Clean Air Act; the Clean Water Act; the Alberta Environmental Research Trust Act; the Groundwater Control Act; the Water Resources Act; the Beverage Container Act; the Agriculture Chemicals Act; the Litter Act; the Land Surface Conservation and Reclamation Act; the Drainage Districts Act; the Hazardous Chemicals Act; the Special Waste Management Corporation Act, and the Department of Environment Act.

Manpower and Training

Since 1981, the Alberta economy has been in a state of transition. In the period prior to 1981 the Alberta economy was characterized by an investment boom in energy projects. High levels of immigration gave Alberta the fastest growing population and labour force in Canada. The economic downturn which commenced in 1981 has resulted in a restructuring of many Alberta industries and the downsizing of the construction sector. Coupled with the industrial transition to a period of more normal economic growth has been an abrupt reversal in the flow of migrants. The net outflow of individuals from Alberta has helped to reduce the rate of labour force expansion to match more closely the needs of a more stable economic environment.

Despite the economic downturn, the service sector remained strong with employment continuing to grow in the 1981-83 period. Also, employment remained unchanged in the transportation and trade sectors. The agriculture sector recorded an increase in employment in 1983, reversing a long-standing declining trend. The construction and manufacturing industries were most severely affected by the economic downturn, with both industries showing decreasing levels of employment since 1981.

The participation rate is that proportion of the population, aged 15 years and over, which is employed or actively seeking work. The Alberta participation rate, despite the economic downturn, remains the highest in Canada, with 71.6% of the working age population in the labour force in 1983. The male and

female participation rates are also the highest in Canada. The Alberta economy is also able to provide the most jobs in relation to population of any Canadian province. The employment to population ratio for Alberta was 63.9% in 1983, the highest in Canada.

Employment rose in the managerial, sales, and service occupations from 1981 to 1983 while the size of the clerical group remained unchanged. These occupations accounted for nearly 70 per cent of the Alberta labour force in 1983. The number employed in the primary occupations increased slightly in 1983, indicating a recovery in the energy sector.

The downturn in economic activity has held significant challenges to government administrators overseeing different aspects of the Alberta labour markets. The response to those challenges as well as those of a more ongoing nature has taken many facets: career information and placement services to future labour market participants and those seeking to change or obtain employment, summer student and winter employment programs, and special manpower programs for particular population groups and the disadvantaged. In addition, government officers counsel and consult with firms on behalf of employees as well as monitoring individual industry developments for adverse labour market consequences.

The Alberta Vocational Training Program was designed to train or retrain adults to make them more employable. One of its components, program support, may fund ad hoc vocational programs where a need has been identified. Another, relating to vocational training of the disadvantaged and disabled, provides vocational counselling and financial

TABLE 8.20

APPRENTICES REGISTERED, ATTENDING SCHOOL, RECEIVING CERTIFICATION, AND EXAMINATIONS WRITTEN - ALBERTA - 1971 AND 1974-1983

Apprentices	1971	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Registered	8,716	11,280	13,303	16,059	18,327	19,805	22,525	25,699	28,157	27,953	24,188
Attending School in Block of Formal Training	8,599	8,978	10,745	12,932	14,359	15,992	17,485	18,859	20,002	21,975	20,547
Certificates issued											
a) Indicating Completion of Apprenticeship	3,090	2,546	2,924	2,359	2,800	3,412	3,605	4,175	4,360	5,184	5,308
b) Indicating Permanent Journeyman Status	1,986	1,855	1,802	3,741	6,210	6,856	7,477	10,661	9,887	13,238	17,500*
Examinations Written	19,844	20,644	23,458	31,825	33,367	36,305	39,864	44,010	49,741	52,475	47,091

*Includes 3,000 replacement certificates to electricians and fitters.

TABLE 8.21

**APPRENTICES
REGISTERED AND
CERTIFICATED,
EDUCATIONAL
REQUIREMENTS,
AND LENGTH OF
APPRENTICESHIP
TRAINING PERIOD
-ALBERTA - 1983**

	Registered Apprentices	Completed Apprenticeship	Journeyman Certificates Issued	Minimum Education Grade	Length of Apprenticeship- Years or Periods
Agricultural Mechanic	64	40	44	Com. Ent.	2
Appliance Serviceman	35	14	28	10	3
Auto Body Mechanic	771	162	243	9	3
Baker	98	29	42	9	3
Barber			65	10	2
Beautician			1,052	10	2
Boilermaker	149	33	77	Com. Ent.	3
Bricklayer	208	66	87	9	3
Cabinetmaker	299	44	57	9	4
Carpenter	3,025	460	700	9	4
Communication Electrician	1,060	241	257	11	4
Cook	317	71	158	9	3
Electrical Rewind Mechanic	62	11	25	10	4
Electrician	3,811	798	6,970	Math 20	4
Electronic Technician	131	21	54	10	4
Elevator Constructor			26		
Floorcovering Mechanic	35	5	12	9	3
Gasfitter	128	58	739	9	3
Glassworker	199	23	40	9	4
Heavy Duty Mechanic	1,777	490	747	Com. Ent.	4
Heavy Equipment Operator	4	0	386	9	3
Instrument Mechanic	480	69	155	Com. Ent.	4
Insulator	542	64	81	9	4
Ironworker	188	77	81	Com. Ent.	3
Lather - Interior Systems Mech.	106	18	22	9	3
Machinist	424	88	157	9	4
Millwright	667	101	286	10	4
Motor Mechanic	2,481	515	852	9	4
Painter and Decorator	187	50	111	9	3
Partsman	453	146	234	10	3
Plasterer			3		
Plumber	1,970	520	663	Com. Ent.	4
Power Lineman	207	98	175	10	3
Power System Electrician	39	11	14	10	4
Printing and Graphic Arts	89	0	886	9	4
Refrigeration Mechanic	203	31	52	9	4
Roofer	114	8	50	9	3
Sheet Metal Mechanic	1,112	163	186	Com. Ent.	4
Sprinkler Fitter	166	19	24	Com. Ent.	4
Steamfitter/Pipefitter	312	63	275	Com. Ent.	4
Steel Fabricator	35	0	29	9	3
Tilesetter	69	16	16	9	3
Transport Refrigeration Mechanic	19	4	6	Com. Ent.	3
Water Well Driller	60	17	28	9	2
Welder	2,092	664	1,305	9	3
Total	24,188	-	17,500	-	-

Source: Apprenticeship Council of Alberta

assistance. In 1983-84, Program Support funded 362 programs involving 8,620 students. The program for the disadvantaged supported 10,958 students and the program for the disabled supported 1,071 students.

The apprenticeship program is a vital factor in the provision of a skilled workforce. The program covers 50 designated trades. An apprentice works under the supervision of a qualified tradesman and is usually paid an hourly wage which increases according to his experience in the trade and prevailing journeyman rates. Alberta with 10 per cent of Canada's population trains roughly 22 per cent of Canada's apprentices.

Training programs related to several of the apprenticeship trades are available in Alberta high schools, colleges and technical institutes. These approved programs are not part of the apprenticeship system but those who complete them may receive credit towards an apprenticeship.

The Lieutenant-Governor in Council may designate any trade, or consider an industry's request for trade designation. Designated trade courses are continually being reviewed and revised by a trade committee consisting of employers and employees engaged in that trade, together with institutions and apprenticeship supervisors.

Labour

In Canada responsibility for labour relations is shared among the federal, provincial and territorial governments. Broadly defined, the federal jurisdiction includes banks, international and interprovincial transportation and communications, broadcasting, grain elevators and most Crown Corporations. Enterprises not regulated by the federal government come under the jurisdiction of the province or territory where they are located. Approximately 90 per cent of employees in Alberta are regulated by provincial legislation.

Like every other jurisdiction in Canada, Alberta has legislation that sets minimum employment standards.

The Employment Standards Act establishes minimum standards for hours of work, payment of wages, overtime pay, minimum wages, vacations, vacation pay, general holidays, general holiday pay, termination of employment, maternity benefits, and the employment of young persons. While employers may set higher standards, they cannot give employees less than the minimum standards.

In addition, the province has enacted special employment standards legislation governing the lumbering and mining industries.

The Industrial Wages Security Act gives employees in the lumbering and mining industries added wage protection. Responsibility for administering the Employment Standards Act and the Industrial Wages Security Act rests with Alberta Labour and further information concerning the requirements of the legislation may be obtained by contacting the department.

The principal legislation regulating labour relations in Alberta is the Labour Relations Act. In addition there are other acts that regulate labour relations for specific groups of employees. These acts include: The Colleges Act, which regulates labour relations between boards of governors of post-secondary educational institutions and academic staff employees; the Police Officer's Collective Bargaining Act which regulates labour relations between municipalities and policemen; and the Public Service Employee Relations Act, which regulates labour relations for civil servants employed by

TABLE 8.22

**LABOUR FORCE -
MALE AND FEMALE
AND
PARTICIPATION
RATES BY AGE
GROUP - ALBERTA -
1951, 1961, 1971,
1981
(AS OF JUNE 1)**

	Labour Force	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
1951	Male (000)	20	36	72	63	49	36	16	291
	Participation rate %	53.7	94.2	97.1	97.1	95.2	86.5	39.2	84.0
	Female (000)	10	16	15	11	6	4	1	63
	Participation rate %	27.8	42.7	20.0	17.8	15.8	11.6	4.3	20.4
1961	Male (000)	23	40	96	84	63	40	15	362
	Participation rate %	46.0	90.8	95.5	95.9	93.8	84.1	29.8	80.7
	Female (000)	15	21	28	29	23	10	2	128
	Participation rate %	30.3	46.8	30.0	34.4	37.0	25.4	5.2	30.8
1971	Male (000)	48	64	106	96	76	50	15	455
	Participation rate %	57.9	91.1	95.4	95.4	93.2	83.6	25.9	80.5
	Female (000)	33	45	50	46	42	23	5	244
	Participation rate %	41.9	63.7	46.4	49.6	51.6	39.2	8.0	44.4
1981	Male (000)	67	128	220	130	100	62	16	724
	Participation rate %	61.7	94.1	97.0	97.1	95.1	82.7	23.3	84.7
	Female (000)	57	99	137	85	60	33	6	476
	Participation rate %	54.3	78.0	66.1	68.0	61.9	41.5	7.4	58.2

Note: This historical table is included mainly to show the change in the female participation rate in the thirty year period.
Source: Census of Canada 1951-1981

TABLE 8.23

**LABOUR FORCE -
MALE AND FEMALE
AND
PARTICIPATION
RATES BY AGE
GROUP - ALBERTA -
1979-1983
(ANNUAL
AVERAGES)**

	Labour Force	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
1979	Male (000)	73	106	181	115	95	58	14	642
	Participation rate %	68.7	91.1	97.0	98.1	96.0	81.0	21.6	84.3
	Female (000)	61	78	107	74	54	29	-	406
	Participation rate %	58.9	70.9	60.8	66.1	58.3	39.1	-	54.8
1980	Male (000)	73	115	198	122	98	59	13	676
	Participation rate %	67.9	91.6	96.6	98.2	95.9	80.2	19.7	84.3
	Female (000)	65	86	121	81	58	30	-	444
	Participation rate %	62.5	73.0	63.5	68.5	60.8	38.9	-	57.1
1981	Male (000)	75	122	218	129	101	60	13	718
	Participation rate %	69.6	91.5	97.4	97.9	96.5	80.0	19.1	85.1
	Female (000)	63	96	140	84	61	31	4	480
	Participation rate %	61.8	76.6	67.9	67.4	63.1	39.5	4.5	59.0
1982	Male (000)	69	121	230	138	101	63	11	732
	Participation rate %	65.0	89.2	96.3	97.2	95.2	80.1	16.4	83.7
	Female (000)	58	98	149	95	60	32	4	495
	Participation rate %	58.2	75.9	68.0	70.4	60.9	39.1	4.5	58.7
1983	Male (000)	62	115	236	145	102	63	14	737
	Participation rate %	60.6	88.2	95.9	96.9	94.9	77.7	19.3	83.0
	Female (000)	52	97	155	102	67	35	5	513
	Participation rate %	53.7	76.8	68.8	71.9	67.2	42.2	5.5	59.8

Source: Statistics Canada Labour Force Annual Averages Cat. No. 71-529

the province of Alberta. Policemen, firefighters, hospital employees and provincial public servants are prohibited from striking.

As outlined in the Labour Relations Act, the Labour Relations Board is an independent, quasi-judicial tribunal that is responsible for the administration of procedures that regulate labour relations between employers and trade unions

under the jurisdiction of the Act. Pursuant to the Act, the Board processes applications for certification and the revocation of trade unions as bargaining agents, regulates the procedure by which a trade union may proceed to a lawful strike or an employer to a lawful lockout. The Board also deals with the registration of employers' organizations in the construction industry and with unfair labour practices.

POPULATION* OF
WORKING AGE, IN
AND NOT IN
LABOUR FORCE
EMPLOYED AND
UNEMPLOYED, AND
PARTICIPATION
RATES - MALE AND
FEMALE - ALBERTA
-1979-1983
FIGURES IN
THOUSANDS
UNLESS OTHERWISE
INDICATED

	1979	1980	1981	1982	1983
Population 15 years and over					
Male	725	810	844	871	888
Female	741	777	814	843	858
Total	1,503	1,579	1,657	1,718	1,745
Labour Force					
Male	642	678	718	732	757
Female	406	444	487	495	505
Total	1,048	1,120	1,198	1,227	1,249
Not in Labour Force					
Male	120	126	126	143	131
Female	335	333	334	348	349
Total	455	459	460	491	496
Employed					
Male	621	654	693	673	653
Female	386	424	459	459	462
Total	1,007	1,078	1,152	1,132	1,115
Unemployed					
Male	21	23	25	59	84
Female	20	19	21	36	51
Total	41	42	46	95	134
Unemployment Rate (%)					
Male	3.3	3.3	3.5	8.0	11.4
Female	4.9	4.4	4.3	7.3	9.9
Total	3.9	3.7	3.8	7.7	10.8
Participation Rate (%)					
Male	84.3	84.3	85.1	83.7	83.0
Female	54.8	57.1	59.0	58.7	59.8
Total	69.7	70.9	72.3	71.4	71.6

• \mathbb{R}^2 has two generators, \mathbf{e}_1 and \mathbf{e}_2 .

TABLE 8.25

**EMPLOYED
LABOUR FORCE BY
INDUSTRY,
ANNUAL
AVERAGES -
ALBERTA -
1979-1983
(THOUSANDS)**

	1979	1980	1981	1982	1983
Industries					
Agriculture	85	85	88	77	80
Other Primary	59	66	74	69	48
Manufacturing	85	102	106	95	84
Construction	111	104	122	112	88
Transportation, Communications & Other Utilities	93	97	96	95	95
Trade	183	195	203	200	201
Finance, Insurance, & Real Estate	54	59	60	68	61
Service	277	301	323	332	351
Public Administration	61	70	80	84	84
Total	1,007	1,078	1,152	1,132	1,115

Pursuant to the Labour Relations Act, Alberta Labour also provides assistance to unions and management in resolving collective bargaining disputes through mediation. Mediation takes place at the request of either or both parties in a dispute or by order of the Minister of

Labour

The Pension Benefits Act requires that all pension plans covering employees in Alberta comply with certain standards and are registered with the Superintendent of Pensions, who is director of the Pension Benefits Branch of

Alberta Labour. The Pension Benefits Branch is also responsible for investigating complaints and answering enquires from employees concerning their pension plans.

The Individual's Rights Protection Act prohibits discrimination in the areas of race, colour, religious beliefs, ancestry, age, sex, marital status, place of origin or physical characteristics with respect to employment practices and employment advertising. The Act is administered by the Alberta Human Rights Commission.

Alberta has the fourth largest labour force in Canada with only Ontario, Quebec and British Columbia ranking higher. In Alberta in 1983, there were 1,249,000 persons over the age of 15 working or looking for work, either part-time or full-time. This figure includes 737,000 males and 513,000

females. Alberta continues to have the highest participation rate of any province in Canada, which means that a large percentage of Alberta's population is in the work force. Approximately 72 per cent of Albertans over the age of 15 are working or willing to work.

As a proportion of the work force, Alberta's trade union membership is one of the lowest in Canada. According to a 1982 survey, approximately 278,000 people belonged to trade unions in Alberta.

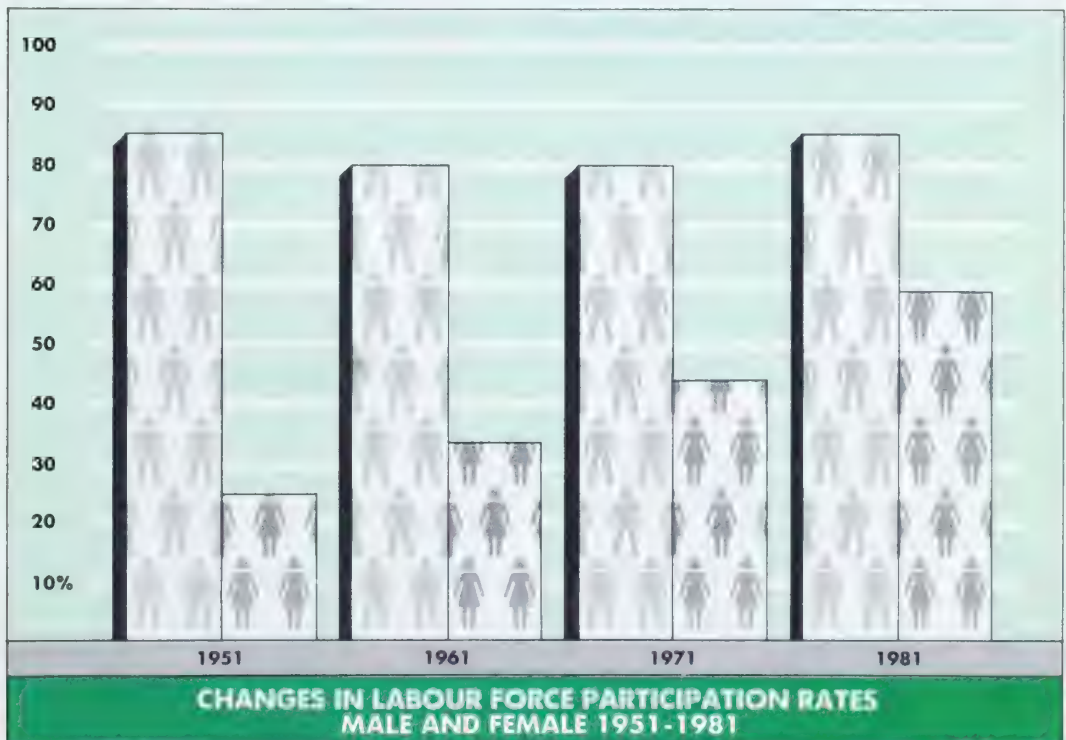
The largest union membership is in the public sector, which includes provincial and municipal employees as well as health care, education and utilities workers. Outside the public sector, the commercial and industrial construction industries are the most heavily unionized.

TABLE 8.26

**EMPLOYED
LABOUR FORCE BY
OCCUPATION,
ANNUAL
AVERAGES -
ALBERTA -
1979-1983
(THOUSANDS)**

	1979	1980	1981	1982	1983
Occupational Group					
Managerial Professional	225	240	275	283	291
Clerical	163	184	194	197	191
Sales	109	114	119	121	123
Service	120	129	142	147	155
Primary	108	110	112	99	101
Processing	99	111	116	104	95
Construction	101	95	105	97	82
Transportation	48	57	50	47	45
Materials Handling & Other Crafts	36	38	38	36	32
All Occupations	1,007	1,078	1,152	1,132	1,115

Source: Statistics Canada: Labour Force Annual Averages Cat. No. 71-529





Education

Alberta's educational system ranges from pre-school programs through to university postgraduate study. Included among the goals of the system are the teaching of basic subjects and skills, the creation of a skilled workforce, and the provision of opportunities for acquiring knowledge.

Pre-school programs are not universal in Alberta, but are becoming increasingly important. For those attending classes for grades one to twelve, education is provided on a "no-charge" basis. It is now customary for students to complete basic schooling in preparation for further education. High school curricula include matriculation (which leads to university or college), general diploma and vocational programs or combinations of these. There are academic high schools,

vocational high schools and composite high schools.

The Advanced Education system in Alberta currently has twenty-eight post-secondary institutions. This includes four universities, three technical institutes, ten public colleges, three private colleges, four Alberta Vocational Centres, the Alberta Petroleum Industry Training Centre, the Community Vocational Centres and the Banff Centre. In addition, there are six hospital based schools of nursing, five community consortia and eighty-five further education councils.

During the 1982-83 period, post-secondary institutions served more than 500,000 people through full-time, part-time, apprenticeship, credit, non-credit, and further education programs.

In this period, approximately 120,000 people were served by the four universities and the Banff Centre. Approximately 37,000 of these were in full-time attendance at the Universities of Alberta, Calgary and Lethbridge. The University of Alberta in Edmonton is the oldest and largest of the four. The University of Calgary, at first a separate campus of The University of Alberta, became autonomous in 1966.

The University of Lethbridge was added to the system in 1967. These three universities fulfill the traditional roles of a university in teaching, research and in providing public service. A wide range of programs at the undergraduate and graduate level is provided. Athabasca University was established in 1970 to provide part-time home study opportunities. The Banff Centre was established in 1933. It is a professional training centre for arts, management studies, environmental studies and conferences of all kinds.

The Southern Alberta Institute of Technology in Calgary, established in 1916, and the Northern Alberta Institute of Technology in Edmonton, established in 1963, offer a wide variety of vocational, business, technology-oriented programs as well as technical training programs for apprentices. In 1982-83, the total number of individuals served was in the order of 102,000 including credit, non-credit, correspondence and apprenticeship programs. For the same period full time registrations were approximately 11,000. Westerra Institute of Technology in Stony Plain is the third and newest technical institute in Alberta. It started its first

intake of apprenticeship students in 1983-84. The three technical institutes prepare students for career-oriented employment in industrial services and have a primary role in creating and maintaining an adequate supply of well-trained manpower.

There are ten Public Colleges in Alberta. They are situated in Calgary, Edmonton, Fairview, Fort McMurray, Grande Prairie, Lethbridge, Lloydminster/Vermilion, Medicine Hat, Olds and Red Deer. Courses offered include one and two year career-oriented certificate/diploma programs, university transfer and apprenticeship programs at some colleges and a wide range of further education and community services programs. In 1982-83, approximately 110,000 people were served by the public colleges. Of these, about 13,000 students were in full-time attendance.

There are four private colleges which are affiliated to the University of Alberta. They are Camrose Lutheran College in

Camrose, Canadian Union College in College Heights and Concordia College and the King's College in Edmonton. They offer a variety of programs as well as university transfer programs. In 1982-83, 1,200 people were served in the university transfer programs.

Four Alberta Vocational Centres are located in Calgary, Edmonton, Grouard and Lac La Biche. These institutions provide a comprehensive range of needed quality adult education programs concentrating on adult basic education, skill training and services responsive to local, regional and provincial needs. To complement them, about twenty smaller units known as Community Vocational Centres provide training courses and other educational services to remote and isolated communities in North Central Alberta. In 1982-83, total registrations at the Alberta Vocational Centres and the Community Vocational Centres were approximately 13,000. The Alberta Petroleum Industry Training Centre in

TABLE 8.27

**ENROLMENT IN
THE ALBERTA
POST-SECONDARY
SYSTEM 1975-76 to
1983-84**

	University of Alberta Calgary and Lethbridge	Athabasca University & Banff Centre	Public Colleges	Private Colleges	Technical Institutes	Vocational Centres and the Alberta Petroleum Industry Training Centre	Schools of Nursing
1975-76	32,022	3,424	8,812	540	8,497	7,552	1,307
1976-77	32,366	3,747	9,254	596	8,905	9,238	1,176
1977-78	31,827	5,024	10,379	663	9,483	8,891	1,077
1978-79	30,847	6,306	9,530	656	9,990	9,776	1,084
1979-80	30,274	7,052	9,278	790	9,909	9,587	1,062
1980-81	30,852	8,161	9,940	734	10,165	10,755	1,116
1981-82	33,448	9,310	10,955	797	10,334	11,187	1,183
1982-83	36,679	11,239	12,852	1,041	11,310	13,846	1,308
1983-84*	39,907	11,761	14,536	1,155	11,475	16,500	1,348

* Preliminary

Source: Advanced Education, Alberta

TABLE 8.28

**ENROLMENT,
NUMBER OF
SCHOOLS, SCHOOL
ROOMS AND
TEACHERS IN THE
ALBERTA PUBLIC
SCHOOL SYSTEM -
1975-76 to
1983-84**

	Enrolment in Public & Separate Schools	Schools	School Rooms	Teachers	Student/ Teacher Ratio
1975-76	421,785	1,341	17,478	23,131	18.2/1
1976-77	423,314	1,361	18,190	23,193	18.3/1
1977-78	421,833	1,388	18,725	23,211	18.2/1
1978-79	418,715	1,405	19,307	23,363	17.9/1
1979-80	415,595	1,423	19,754	23,560	17.6/1
1980-81	417,016	1,421	19,791	24,036	17.3/1
1981-82	419,656	1,467	22,692	24,331	17.2/1
1982-83	423,690	1,505	24,569	25,500	16.1/1
1983-84*	422,764	1,555	25,435	25,000	16.9/1

* Preliminary

Source: Advanced Education, Alberta

Edmonton serves the training needs of people employed or seeking employment, in the province's oil well drilling industry. Registrations in 1982-83 were approximately 400.

In 1982-83, the Foothills Hospital in Calgary, and the Royal Alexandra Hospital, University of Alberta Hospital and the Misericordia Hospital in Edmonton became members of the Advanced Education system. These hospital based schools of nursing offer diploma programs in nursing and nursing refresher programs. In 1982-83, about 1,300 were served by these four institutions. Alberta Hospital in Ponoka and Alberta Hospital in Edmonton joined the system in 1983-84. Psychiatric nursing programs are offered at these institutions.

In order to provide service to areas of the province that are not in close proximity to post-secondary institutions, five community consortia were established in 1981-82. Community Consortia are associations of institutions working co-operatively with local citizens, to provide post-secondary credit programs leading to a diploma, degree or certificate being awarded by a participating institution or a recognized licensing body. They are located in Big Country, Chinook, Peace River, Pembina and Yellowhead regions. Approximately 900 people were served by the five consortia in 1982-83.

There are currently 85 Further Education Councils in the Province. These councils, consisting of members from institutions, agencies and local volunteers, administer the provision of non-credit programs within their communities. In 1983, a total of about 330,000 adults participated in about 22,000 courses throughout the province.

Through the major post-secondary institutions, consortia and further education councils, people living virtually anywhere in the province can gain access to educational opportunities.

Communications

The sheer size of Canada has made modern communications a vital element in the country's development. Alberta is no exception to this national pattern.

Broadcast media have extensive coverage. The average household has more than one radio. There are 44 AM and 13 FM radio broadcast originating stations, as well as numerous rebroadcast stations. A total of 12 television stations, based in Edmonton, Calgary, Lethbridge, Lloydminster, Medicine Hat and Red Deer are in operation. All but two of these stations are affiliated with nation-wide networks. Rebroadcast stations provide virtually province-wide coverage. Nearly every household now owns a television set; almost 90 per cent have a colour set. Major centres receive cable television connecting them with American networks. The Alberta government operates a radio and television network (ACCESS) which emphasizes educational programming.

The more remote regions of northern Alberta benefit from the communications satellite "Anik", through which the Canadian Broadcasting Corporation provides radio and television programming to sparsely populated areas throughout northern Canada. Ten daily, and 139 weekly newspapers are published. The dailies are published in Calgary, Edmonton, Lethbridge, Lloydminster, Medicine Hat, Red Deer, Grande Prairie and Fort McMurray. They have a total circulation of nearly 540,000 copies, reaching almost 85 per cent of all households in the province. Weekly newspapers report a gross circulation of over one million copies.

Alberta's magazine publishing trade is also growing as commercial printing plants improve and upgrade their equipment. Regular publications serve such specialized fields as the oil industry, agriculture, leisure, and business development. A number of the publications have international circulation.

Albertans are among the country's greatest telephone users with over one million subscriber lines in service.

Alberta Government Telephones, a Crown corporation, owns over 735 thousand lines. The City of Edmonton operates Edmonton Telephones, which has nearly 323 thousand lines.



*Telecommunication
Tower near Pincher
Creek*

A radio-telephone system provides much-needed contact with isolated areas not serviced by ground telephone lines. A microwave network, owned by Alberta Government Telephones (a partner in the Trans Canada Telephone system) and by Canadian National-Canadian Pacific Telecommunications, extends to almost every area of the province. Both have national and international links. CN-CP Telecommunications provides wire service in many Alberta centres.

In addition to the communication services outlined above, there are numerous privately-owned film companies, art houses, advertising agencies, printing operations and publishers.



The Land

Geography

With a total area of over 66 million hectares, Alberta is approximately the combined size of West and East Germany, the Netherlands, Belgium, Luxembourg, Switzerland, Denmark and Sweden in Europe, or of the 13 northeasternmost states of the United States.

Alberta is one-fifteenth of Canada in area. Situated in the northwestern part of North America between 49 degrees and 60 degrees north latitude and 110 degrees and 120 degrees west longitude, it is 1,217 kilometres in length from north to south, and between 293 and 650 kilometres in width from west to east. Within this area, there is a great diversity and abundance of natural resources.

The northeastern corner of Alberta is largely an ice-scoured plain, a part of the Canadian Shield. The potential for development of agriculture and forestry is limited because of climate, topography and location. Wildlife and recreation have extensive rather than intensive use.

Almost all of the southwestern half of mountains and foothills ridges has been glaciated several times. Some of the outlying foothill ridges and most of the higher peaks were not over-run by moving ice, but most areas exhibit striking features of alpine glaciation. Alpine glaciers and icefields, indicating an approximate balance between winter snowfall and summer melting, are present today on some of the higher mountains. Post-glacial erosion and deposition, including landslides where unstable formations were left unsupported, and the irregular clothing of slopes by vegetative cover, have added to the scenic diversity.

Mountain peaks range up to 3,747 metres in elevation and the larger mountains are rugged, with local relief of up to 2,130 metres. Major passes are between 1,128 and 1,830 metres in elevation. The larger broad glaciated valleys have shallow slopes, thus allowing relatively easy road and rail development into and through the mountains. Use conflicts are developing in major highway belts and in potential mining areas but only small parts of this large region are intensively used. Much of the mountainous region lies in National and Provincial Parks and Provincial Forest Reserves. The latter are zoned for watershed, wildlife, recreation, mining, commercial grazing, forestry and multiple purpose uses.

The greater area of Alberta is part of the Interior Plain of North America and is underlain by sedimentary rock. Younger, softer formations predominate at surface levels. Rock weathering has produced relatively fine textured soil materials. Continental glaciation from the Hudson Bay region extended to the foothills where it joined with ice of alpine origin. Only the upper parts of the Cypress and Porcupine Hills were not covered by ice.

Some surfaces have been eroded by ice and meltwaters, but most have received materials borne by them. Large amounts of soil material of Shield origin, including the harder stones and boulders present, are widely distributed. Yet most of the drift is of relatively local origin. An important feature of deglaciation was that the general slope of the land was toward the melting continental ice mass. Meltwaters and run-off from land surface were ponded against the ice front at

*Wheat harvest in the
Red Deer River Valley
Region*



successively lower levels across the plains. The clays which were widely deposited are among the best parent materials for soil development and the flat to gently undulating terrain is excellent for agricultural activities. Undulating to rolling till plains and many kinds of moraines are present, and include many hummocky moraines deposited by "dead ice". The rougher topography and numerous sloughs in moraine areas are disadvantageous for agriculture, but cultivation is not uncommon because the soil is often relatively stone-free and erosion problems are not as great as in more humid regions. Moraine areas are among the best for wildlife, particularly the numerous migratory waterfowl and shore birds. Gravel deposits are widely available.

The general surface slope is from west to east in southern Alberta and from southwest to northeast in northern Alberta. Elevations range from approximately 1,220 metres in the foothill valleys to less than 215 metres in the northeast near the margin of the Shield. Numerous uplands such as the Cypress, Porcupine, Swan, Clear, and Buffalo Head Hills and the Caribou, Birch and Pelican Mountains rise as high as 760 metres above the neighbouring plains. The local relief within the plains, has been

accentuated by the incision of river valleys 30 to 230 metres in depth.

The Peace-Athabasca delta complex is the world's largest fresh water delta. Wildlife is abundant and the area has long been important in the fur trade. Other deltas are smaller, but many were formed on the shores of lakes in the past and most stabilized sand plains have developed on their materials.

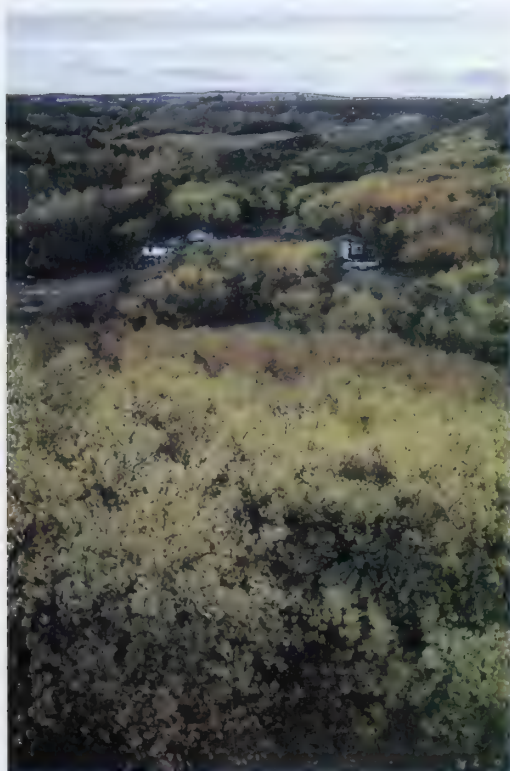
Perceptions of flatness can be formed in some of the more extensive prairie plains, particularly in the south where there are few trees to accentuate relief. These perceptions are intensified by the clean dry air which permits one to see great distances. In reality, however, topographical diversity is quite great within the plains as evidenced by the rough foothills and mountain skyline in the west.

Alberta now has almost 30 per cent of the occupied agricultural land of Canada. This agricultural land area is almost three times that of Ontario, four times that of Quebec and over nine times that of British Columbia. In each of these other provinces, land is used that would be considered submarginal in Alberta.

The soil patterns of Alberta reflect the influences of soil forming factors — parent materials, slope and drainage, climate and vegetation — acting through time and modified by human use. The effects of the ice-age are still pronounced and local variations are numerous. Post-glacial erosion and deposition, weathering of bedrock and of drift of various origins, and organic build-up are all reflected in soil patterns.

The brown, dark brown and black soils and the dark grey wooded soils have developed under grass cover in semi-arid and sub-humid climates. Water surpluses are inadequate for much soil leaching; thus humus and fine mineral soil are abundant in fertile surface horizons. Water deficits are greatest in the brown soil zone where vegetative cover densities have not been great enough for major humus development. Cultivation ranges from about one-quarter of the brown soil zone to two-thirds of the black soil zone. Only one-third of the dark grey wooded soils are cultivated, largely because these soils are less fertile. Because more humid climates prevailed in recent centuries, tree cover has replaced the grass, and soil qualities have been degraded to some extent. The more humid climate is

Farm in Cyprus Hills area, near Elkwood





advantageous for crop growth, particularly in light of growing emphasis on forage crops. Much of the recent expansion of cultivated land has been in these areas.

Grey wooded soils, developed largely under mixed forest cover, are the most widespread. Only 5 to 10 per cent of these soils are cultivated, mainly because of frost and drainage limitations and low fertility. Leaching has not been as great as in more humid forest regions because moisture surpluses are minimal and most soils are moderately high in lime content.

Podzol soils are present in some of the most humid upland areas. Such soils are more acidic and are rarely cultivated. Solonchetsic soils have developed largely in grassland areas where parent materials are saline. Some are cultivated but they are less productive than adjoining grassland and parkland soils. Organic soils are widespread in the more humid forest areas but, because better soils are available elsewhere, few have been drained or cultivated. Permafrost is a factor in drainage limitation in some northern areas.

Cultivation is expanding in Alberta, partly in new land (largely in the Peace River region) and partly within settled areas where farmers are clearing, draining, and otherwise intensifying their use of areas not previously developed. Reversion of cropland to forest and rough pasture is also taking place and some of the better lands are being converted to urban and industrial uses. There is a greater potential for expansion of cultivated land areas in Alberta than in any other province but the better undeveloped lands are of limited extent.

Geology

Except for its extreme northeast corner, Alberta forms part of the western Canada sedimentary basin, a large area extending from the International Boundary along the southern margin of the Prairie Provinces to the Mackenzie River delta bordering the Arctic Ocean.

The region is underlain by sedimentary rock formations of different ages deposited in ancient seas and low-lying alluvial or coastal plains which covered much of western Canada during the Paleozoic and Mesozoic eras (500 million to 60 million years ago). During early Tertiary time, about 50 million years ago, the western margin of the basin was

uplifted, and the strata were folded and faulted to form the Rocky Mountains and foothills. Since then, the geologic history of western Canada has involved erosion of the plains and mountains rather than deposition in a sedimentary basin (except for a brief period during the Pleistocene epoch when unconsolidated glacial sediments of various types were deposited on the bedrock surface).

Three major physiographic divisions reflect the composition and structure of the bedrock formations of the province. The smallest of these divisions — the Canadian Shield — occupies about 15,540 square kilometres in the extreme northeast corner of Alberta, adjacent to Lake Athabasca. The Shield consists of ancient igneous and metamorphic rock of Precambrian age — mainly granite, gneiss, and various types of schist — which, in other regions of Canada, contain important deposits of Metallic minerals. Some showings of uranium and molybdenum minerals have been found in the Shield rocks, but no commercial mineral deposits have been developed as yet. Nevertheless, only part of this region has been mapped in detail, and considerable scope exists for metallic minerals exploration.

Most of Alberta lies within the Interior Plains, a region of generally low to moderate relief underlain by nearly flat-lying sedimentary strata of variable composition and origin. In the northeast, Devonian carbonate and evaporite rocks underlie the lowlands about the margin of the Canadian Shield, dipping gently southwest under the cover of younger Cretaceous strata. The Devonian rocks contain large deposits of limestone, gypsum, and salt on or near the surface, and the salt deposits continue at greater depths beneath much of east-central Alberta. Also, the more deeply buried Devonian strata of northwestern and central Alberta contain much of the province's gas and oil reserves. They are found in ancient reef-rocks that grew in the seas covering the area during Devonian time.

Cretaceous and Tertiary strata comprise the bedrock over the larger part of the Plains, forming a series of sandstone and shale formations which extend from the International Boundary in the south to the British Columbia and Northwest Territories boundaries in the northwest. In general, the formations dip gently to



the south and west, with the result that successively younger strata form the bedrock towards the margin of the Rocky Mountain Foothills. Cretaceous strata of the Plains contain much of Alberta's mineral wealth, including the Athabasca and Cold Lake oil sands, the subbituminous (thermal) coal deposits of central and southern Alberta, and a significant portion of the conventional oil and gas reserves. They also contain major deposits of metallic and industrial minerals, including iron, bentonite, and kaolin clays.

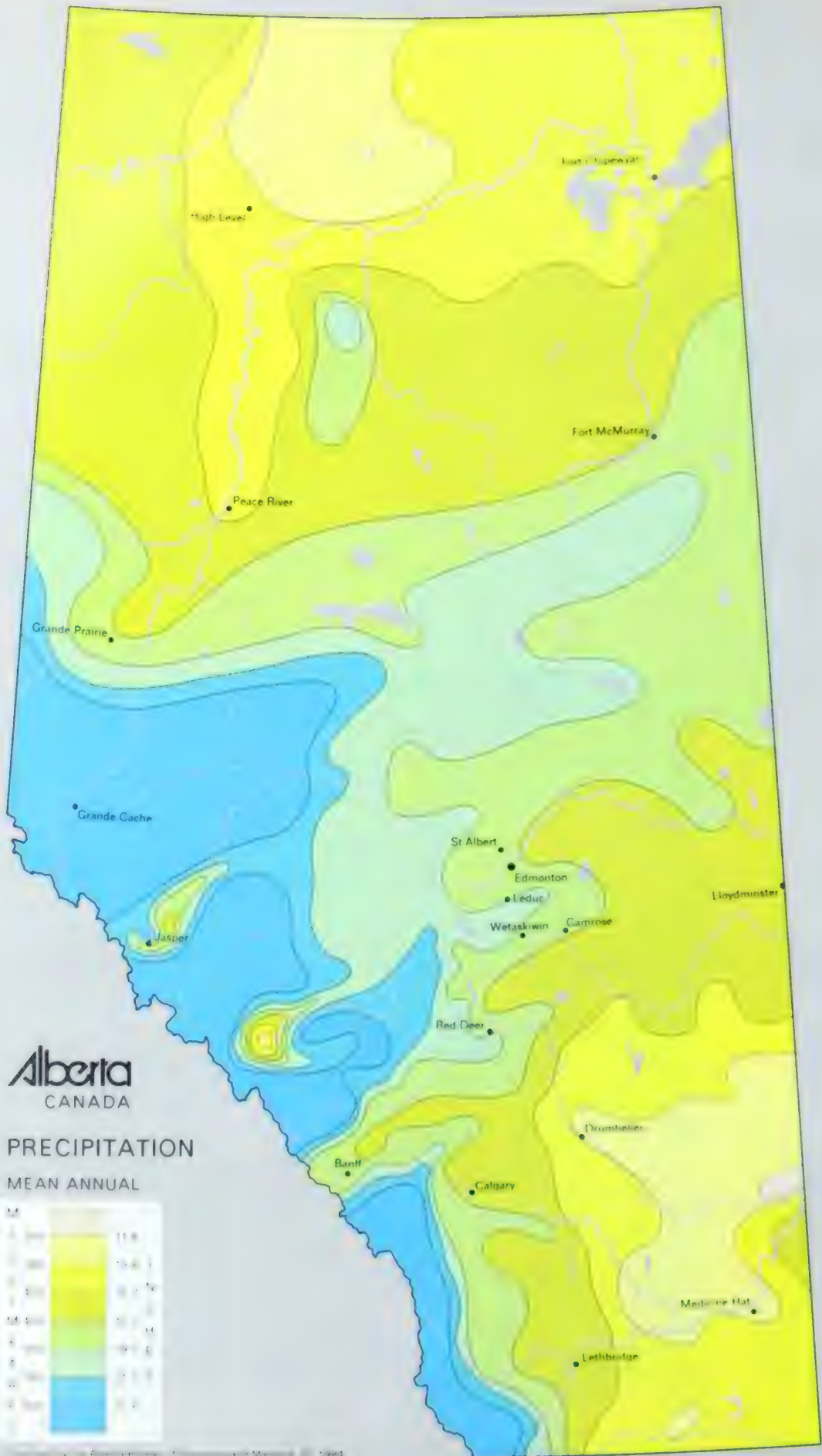
The Rocky Mountains and Foothills form a belt of folded and faulted sedimentary strata from 40 to 200 kilometres wide, extending along the southwestern margin of the province. The strata range in age from Precambrian to Tertiary. In general, the Foothills are composed of sandstone and shale formations of Jurassic and Cretaceous ages, and the Rocky Mountains proper are composed of carbonate and quartzite formations ranging in age from Precambrian to Triassic. The Foothills contain important reserves of sour gas and

high grade bituminous coal, much of which is of coking quality. Vast reserves of limestone and dolomite are found within the front ranges of the Rocky Mountains, and scattered deposits or showings of other industrial and metallic minerals have been reported from this region.

Except for some of the higher ridges in the Rocky Mountains and the Cypress Hills in the southeast, the province was covered by thick ice sheets during the Pleistocene epoch, (approximately 10,000 to 15,000 years ago). Consequently, much of the land surface is covered by unconsolidated glacial sediments ranging from a few inches to several hundred feet in thickness. The deposits vary widely in composition, consisting of sand, gravel, clay and unsorted mixtures of all three materials (till). Although glacial deposits obscure or otherwise hinder development of underlying bedrock mineral deposits in some areas, they provide much of the sand and gravel used in the construction industry, and also some of the clay and silica sand used in manufacturing such products as brick and fiberglass.

Dinosaur Provincial
Park near Drumheller







Climate

Alberta has what is commonly known as a continental climate: long, cold winters and mild summers. A combination of several factors determine the province's climate.

The continental interior location of the province results in greater heating in summer and cooling in winter, and in less precipitation than is present in marine areas. The mountain barriers to the west accentuate these patterns by inhibiting the flow of mild, moist air from the Pacific, and by easing the flow of cold air from the north.

In summer the flows of air and the resulting temperature patterns are modified by the drop in land surface elevations as one moves eastward and northward. The ever-changing storm and air-mass movement patterns are based largely on the pressure contrasts resulting from these controls. The latitude of the province is another important factor, as the length of the summer day counteracts the decreasing altitude of the sun as one moves northward.

In January, the average temperature is about -8 degrees Celsius in the southwestern foothills. It becomes colder as one moves northward and eastward to about -25 degrees Celsius in the northeast corner of the province. These cold northern temperatures occur because cold polar continental air dominates this section. Although cold air at times covers the whole province, it is frequently replaced in the southwest by mild air from the Pacific. This Pacific air has become even warmer through the release of the heat of condensation from the heavy snowfalls in the mountains, and by adiabatic heating as it descends along the eastern slopes of the Rocky Mountains, the warm "chinook" winds of southern Alberta are dry, and significant melting and evaporation take place. The coldest temperatures are frequently associated with low wind speeds, low moisture content, and clear skies; thus the cold is not felt so bitterly as in more humid, windy areas.

In July the temperature gradients are shallow with the longer days and lower elevations of the north largely compensating for the difference in latitude. For most of the province, the mean temperatures lies between 15 degrees and 20 degrees Celsius.

In spring and fall, air mass contrasts are greater than in July; the frost-free period is often shortened by surges of cold polar air. The average frost-free period is over 120 days in the southern lowlands and is as short as 60 to 70 days in northern and more elevated areas. Because of the tendency for cold air to lie in lowlying areas, the length of the frost-free period can vary greatly even on an individual farm. The growing season varies with location in the province and is longer in the south. The growth potential index ranges from over 3,000 degree days at Medicine Hat to about 1,600 degree days in the coolest agricultural areas. (The number of degree days of growth potential is derived by totalling the number of degrees above a base temperature of 5 degrees Celsius for each day in the growing season). The large areas of Alberta with favourable landforms and heat sufficient for cereal grains and other crops, plus the smaller southern areas with sufficient heat for irrigated specialty crops, give the province a great potential for agriculture.

Average annual precipitation is about 300 mm in the Milk River Basin, and along the Red Deer River as it approaches the Saskatchewan boundary. It is over 500 mm along the eastern foothills and, in some mountain locations, over 1,500 mm. In the hill country above 54 degrees north latitude, annual precipitation is as high as 550 to 600 mm. In winter, snow is usually associated with a low pressure centre located in Alberta or in the up-slope to the north of the low. Summer rain usually comes either in the form of showers and thunderstorms formed because of surface heating, or from the storms along a cold front as it sweeps southward over the province.

Low-pressure centre "storm tracks" pass from west to east across Alberta. In winter, such storm tracks are predominantly south of the border, but they shift northward into southern Alberta in spring, and into central and northern Alberta in summer. The tracks fluctuate appreciably and there may be wide variations from "normal" precipitation in any given season or year. In summer, warm, moist, tropical air from the Gulf of Mexico occasionally moves into Alberta and relatively heavy rains are experienced, especially in the south and east. In some years, these rains are widespread, in others, absent.

TABLE 9.1

STANDARD 30
YEAR 1951-1980
NORMALS OF
TEMPERATURE,
PRECIPITATION,
AND FROST -
REPRESENTATIVE
LOCATIONS

-ALBERTA

Location	Altitude (metres)	Temperature °C						Precipitation (mm)		Frost Free Days Mean
		Extreme Max.	Min.	January		July		Mean Annual Rain- fall	Snow- fall	
				Max.	Min.	Max.	Min.			
Acme	905	36.7	-43.3	8.9	-19.4	24.4	9.3	307.5	122.8	103
Aden	1036	39.4	-40.0	4.1	-14.8	26.2	11.9	254.4	151.0	129
Alliance	716	37.2	-49.4	-11.6	20.8	23.9	10.3	326.4	127.7	111
Altawan	945	41.1	-45.6	9.3	-21.0	28.8	10.7	231.9	127.7	87
Amisk	701	34.4	-44.4	-11.3	-21.1	23.8	10.1	305.4	83.8	90
Andrew	617	32.8	-44.4	-13.4	-23.4	23.4	10.5	334.3	91.7	118
Athabasca	610	34.4	-46.1	-12.9	-22.9	22.5	10.0	352.6	140.6	111
Banff	1397	34.4	51.1	-6.5	16.4	22.3	7.2	263.1	250.9	86
Beaver Mines	1286	35.6	-45.6	3.9	14.2	23.1	7.9	339.6	304.8	87
Bowden	915	34.4	-45.6	8.4	-19.7	22.8	8.8	354.8	144.9	102
Bow Island	799	40.6	-41.7	-6.0	16.6	27.6	12.4	249.1	94.2	125
Brooks	758	38.9	-45.6	8.4	20.5	25.8	10.8	240.8	104.2	114
Calgary	1067	33.9	-40.0	5.2	16.9	22.9	9.4	283.1	106.1	110
Calmar	716	36.7	-49.4	-10.1	-21.4	23.1	9.5	363.2	125.5	112
Camrose	732	36.7	-47.8	-11.9	-21.9	22.8	10.6	334.5	117.0	113
Cardston	1154	38.9	-41.7	2.3	14.5	25.0	9.4	371.0	279.1	111
Claresholm	1014	33.9	-37.8	4.0	-15.8	25.2	11.0	256.8	210.1	130
Cold Lake	541	36.1	-48.3	-14.0	23.9	22.9	10.9	337.4	135.4	105
Coleman	1341	33.9	-41.1	-4.7	14.1	23.0	6.2	350.9	218.1	46
Columbia Ice Fields	1981	26.1	-41.1	-9.4	19.0	15.2	2.9	238.6	642.9	16
Consort	753	39.4	-46.1	-13.2	-24.0	24.7	8.9	257.2	85.8	88
Coronation	791	37.8	-44.4	11.6	21.3	24.0	10.5	254.7	137.0	115
Cowley	1189	35.6	-43.3	4.3	-15.9	24.2	7.3	316.3	233.1	83
Craigmyle	841	37.2	-45.0	9.8	-19.7	25.0	9.7	280.2	107.7	100
Crossfield	1128	34.4	-40.6	-6.4	-17.6	22.5	8.3	375.5	132.8	92
Drumheller	687	40.6	-40.6	8.9	-20.5	27.3	11.2	236.2	89.5	113
Eckville	960	33.9	-45.6	9.6	-19.8	22.3	8.6	332.1	162.2	94
Edmonton	671	34.4	-48.3	-10.7	-19.2	23.0	11.8	345.6	135.7	140
Edson	923	32.2	-43.3	8.4	-20.3	22.2	7.8	394.7	196.4	71
Elk Point	594	37.8	-53.3	-14.0	25.0	23.1	9.7	335.6	118.2	88
Ellerslie	694	33.3	-47.8	-11.5	21.7	22.4	9.6	338.6	113.6	109
Empress	613	42.2	-47.8	-10.2	21.2	27.3	12.1	202.6	59.9	117
Entrance	1006	37.8	51.1	7.3	20.4	22.1	6.4	345.5	163.6	60
Foremost	884	41.1	-43.3	-6.3	16.8	26.7	11.1	233.6	116.2	126
Forestburg	671	35.6	-45.0	-9.5	-20.4	23.8	11.8	323.1	71.4	137
Fort Assiniboine	671	33.3	-48.0	11.1	24.8	22.9	7.9	360.8	119.9	79
Fort Chipewyan	232	34.4	-50.0	-20.3	31.8	22.4	9.7	245.1	158.4	91
Fort Macleod	950	43.3	-45.0	-3.7	15.3	25.8	10.7	284.5	145.5	125
Fort McMurray	369	36.1	-50.6	16.5	27.1	23.1	9.5	331.8	162.8	84
Fort Saskatchewan	625	35.6	-45.6	-11.3	-21.6	23.5	10.6	325.8	99.7	109
Ghost RS	1434	32.8	-40.6	3.9	-16.7	20.9	5.7	347.3	216.2	58
Grande Cache	1250	31.0	-40.0	2.1	-17.5	20.5	7.1	369.1	278.1	86
Grande Prairie	669	34.4	-52.2	12.4	23.0	22.1	9.7	265.0	179.8	116

TABLE 9.1

CONTINUED

Location	Altitude (metres)	Temperature °C						Precipitation (mm)		Frost Free Days Mean
		Extreme Max.	Min.	January Mean Daily		July Mean Daily		Mean Annual Rain- fall	Snow- fall	
Hanna	817	38.9	-45.6	-10.2	-21.0	24.9	10.6	274.8	113.1	119
High Level	324	34.4	-50.6	-18.5	-30.6	22.8	8.7	257.9	163.6	71
High River	1,219	37.2	-45.0	-4.7	-17.5	23.2	7.3	316.3	172.0	75
Hinton	1,013	33.3	-41.1	-7.0	-17.9	22.1	6.7	390.7	119.2	63
Jasper	1,061	36.7	-46.7	-7.8	-17.8	22.5	7.6	278.7	152.4	90
Jenner	756	42.2	-48.9	-7.9	-20.4	27.9	10.2	286.1	77.2	106
Kananaskis	1,390	33.9	-45.6	-4.0	-16.3	21.8	6.3	360.2	291.6	58
Lac La Biche	565	31.7	-46.1	-13.2	-24.1	22.6	9.6	367.6	133.0	105
Lacombe	847	38.3	-49.4	-10.0	-21.0	23.1	9.2	326.3	122.7	99
Lethbridge	929	39.4	-42.8	-4.5	-16.0	26.1	11.0	269.2	175.8	124
Lloydminster	646	37.8	-46.1	-13.8	-22.7	23.4	11.1	330.6	93.9	120
Manyberries	934	40.6	-42.8	-7.6	-18.7	26.8	11.6	220.6	133.5	123
Medicine Hat	717	42.2	-46.1	-7.0	-18.3	27.3	12.4	236.2	125.5	129
Milk River	975	41.1	-40.6	-5.5	-16.0	26.6	11.1	226.6	84.1	124
Olds	1,040	37.2	-43.9	-7.7	-18.7	22.4	9.1	353.2	135.1	109
Oyen	792	35.6	-42.0	-11.1	-20.4	24.1	11.1	245.6	107.8	124
Peace River	571	36.7	-49.4	-14.9	-25.6	22.3	9.0	256.4	146.4	93
Pincher Creek	1,145	35.6	-41.7	-4.0	-14.9	24.5	8.3	298.4	316.2	106
Raymond	957	37.8	-45.0	-4.2	-15.6	25.8	10.2	260.9	156.7	120
Red Deer	847	37.2	-50.6	-9.7	-20.3	23.0	9.9	328.6	130.1	103
Rimbey	914	32.8	-44.4	-9.4	-19.5	22.2	8.9	367.2	112.2	107
Robb	1,130	32.2	-42.2	-7.1	-19.5	21.3	6.3	416.3	208.4	72
Rochester	648	33.9	-49.4	-13.1	-24.1	22.5	8.6	377.3	97.7	75
Rocky Mountain House	1,015	33.3	-43.9	-7.4	-18.5	22.0	8.6	389.3	187.8	100
Sedgewick	686	39.4	-52.2	-11.8	-22.2	23.9	10.3	305.7	114.8	94
Shining Bank	829	32.8	-49.4	-9.7	-23.1	21.5	7.4	366.1	124.0	85
Sibbald	716	40.6	-46.1	-11.5	-22.4	26.1	10.1	232.2	88.6	95
Stettler	823	37.8	-46.7	-10.4	-20.1	23.7	10.3	321.5	108.8	118
Strathmore	930	35.6	-40.6	-8.3	-19.1	24.0	9.2	283.0	138.0	110
Taber	808	40.6	-43.3	-5.3	-17.1	26.3	11.4	251.7	129.9	131
Thorsby	744	36.7	-48.3	-9.5	-19.2	23.1	10.2	366.8	100.2	103
Three Hills	841	40.0	-48.3	-9.5	-21.7	24.9	8.1	281.7	109.1	76
Trochu	892	36.1	-44.4	-8.9	-20.8	24.7	8.2	239.5	124.7	93
Turner Valley	1,237	32.8	45.6	-4.5	-19.2	21.4	7.3	342.7	231.6	79
Valleyview	762	33.3	-46.1	-10.5	-21.0	22.4	9.2	363.7	168.7	105
Vauxhall	779	39.4	-46.1	-6.5	-18.9	26.8	10.3	228.9	118.5	113
Vegreville	636	35.6	-51.1	-12.4	-23.8	23.2	9.4	319.8	83.8	83
Vermilion	619	37.2	-50.6	-13.1	-23.6	23.2	9.8	313.2	105.8	100
Viking	691	39.4	-56.1	-13.3	-22.7	23.9	10.3	341.5	107.2	107
Vilna	640	34.4	-48.3	-13.8	-25.2	22.5	8.3	352.0	135.6	71
Vulcan	991	37.8	-35.0	-6.9	-17.4	25.4	9.7	295.9	142.3	116
Wanham	607	33.9	-48.3	-13.1	-23.3	22.0	9.7	301.3	159.6	109
Wetaskiwin	756	37.2	-50.0	-10.6	-20.3	23.1	10.2	350.9	140.4	114
Whitecourt	741	33.9	-50.0	-10.8	-22.3	22.2	7.9	395.8	173.7	69

Source: Environment Canada



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ISOTHERMS IN DEGREES
CELSIUS

Produced by the Alberta Bureau
Surveying and Mapping © 19



JANUARY



APRIL



JULY



OCTOBER

Summer drought of varying intensity is widespread, particularly in the southeastern plains.

Winter snowfall is relatively light on the plains. With frequent chinooks in the southern plains and foothill areas, winter grazing by livestock and game is possible. The melting of snow in spring results in increased soil moisture levels and in the greater part of annual stream runoff. Both vary because of fluctuations in snowfall, snowdrift distribution, winter melting and evaporation (largely by sublimation), infiltration capacities, frost pattern, surface detention storage, and other factors. Some of these factors can be modified by tillage and watershed management practices.

Summer precipitation in most agricultural areas is exceeded by the potential combined evaporation and transpiration by plants; spring moisture surpluses are usually exceeded by the deficits of late summer and fall. On the drier plains, summer fallowing is common in alternate years. The deficiencies of crop years may be reduced by as much as 60 mm of extra soil moisture from the years under fallow. Facilities are available for irrigating over 400,000 hectares of the drier plains.

In many forest areas, water surpluses are larger and water deficits small or absent in most years. In drier years, growth is inhibited and fires set by lightning are widespread. Surplus and deficiency patterns are closely reflected in many other vegetation, soil and agricultural patterns. For example, erosion by rain and running water is much less of a problem than in more humid areas of Canada.

Water Resources

Water is found in relative abundance in many areas of the province although climatic differences result in considerable variation in supply from one region to another. Approximately 64 per cent of the land area of Alberta lies within the Mackenzie River system. The river basins that form the Mackenzie system in Alberta (the Athabasca, Peace, Slave and Hay rivers) account for 87 per cent of mean annual river discharges leaving the province. The Churchill and Saskatchewan-Nelson river systems (the Beaver, North Saskatchewan, Battle, Red Deer, Bow, Oldman and South Saskatchewan rivers) cover 35 per cent of the province's land area but contribute only 13 per cent of mean annual river discharges.

Based on mean annual values, the streamflow originating within Alberta is 67.7 billion cubic metres (54.9 million acre feet) per year. An additional 67.3 billion cubic metres (54.6 million acre feet) per year flow in from British Columbia, Saskatchewan and the United States. Less than 10 per cent of water originating in Alberta is withdrawn annually for local use. The other source of water supply is groundwater, which is highly variable in both quantity and quality.

Seasonal variations in flow are characteristic of Alberta rivers and streams. In most years, the greater part of water volume is derived from melting snow. In some years, heavy rains, particularly if they occur in spring or early summer before soil moisture supplies have been depleted, contribute to high water yields.

In the drier southern plains, the average annual water yield is less than 25 mm; in some locations it may range from zero in many years to as much as 110 mm in years with heavy snowmelt and spring rain runoff. Streamflow is flashy, turbid and undependable. In the west-central and northern plains, the average surpluses are from 25 to 100 mm. These also vary greatly from year to year but they are more likely to provide for more dependable full season flow. Local hill areas within the plains have larger and more sustained yields. The Cypress Hills give rise to many streams of regional importance for irrigation and stock-watering. Other hills, especially in the north, have much larger yields than the adjoining plains.

TABLE 9.2

MONTHLY AND ANNUAL DISCHARGES, SELECTED ALBERTA RIVERS – SPECIFIED PERIODS (CUBIC METRES PER SECOND)

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
Athabasca River	mean	32	30	31	47	183	511	506	368	228	120	59	41	181
at Entrance & Hinton	max	68	47	48	141	372	752	883	529	359	199	100	100	219
1915-1939, 1955-1982*	min	18	12	15	23	87	308	352	256	132	70	34	24	141
Athabasca River	mean	188	169	170	537	1,150	1,380	1,460	989	825	610	349	212	689
below Ft. McMurray	max	242	213	224	1,030	2,080	1,890	2,740	1,380	1,510	864	463	293	884
1957-1982*	min	109	109	107	213	551	825	883	578	435	342	233	107	481
Battle River	mean	1	1	2	33	34	13	9	6	5	4	2	1	9
near Unwin, Sask.	max	4	3	12	93	260	68	29	28	47	26	16	8	41
1944-1979*	min	**	**	**	4	4	2	1	**	**	**	**	**	2
Bow River	mean	9	8	8	10	52	128	110	68	40	24	14	10	40
at Banff	max	13	12	10	29	115	210	184	101	72	35	20	14	51
1909-1982	min	6	5	5	6	20	68	53	45	25	15	9	7	28
Bow River	mean	45	43	43	54	102	237	199	132	91	64	50	45	92
at Calgary+	max	78	79	82	107	207	472	437	237	192	106	82	80	147
1908-1982*	min	21	20	19	29	44	120	89	84	59	27	30	22	58
N. Saskatchewan River	mean	53	52	57	159	287	540	538	390	243	138	79	56	216
at Edmonton+	max	131	146	181	432	1,130	1,090	1,210	864	774	294	168	146	363
1911-1982*	min	17	16	25	59	97	188	180	134	108	78	38	20	140
Oldman River	mean	22	24	42	83	251	346	129	42	39	43	37	24	90
near Lethbridge+	max	95	87	144	222	553	941	401	150	249	162	105	56	195
1911-1982*	min	6	7	13	16	40	26	8	6	6	6	12	6	17
Peace River	mean	626	614	615	1,390	3,480	5,070	3,270	1,730	1,290	1,320	985	729	1,770
at Peace River+	max	1,860	1,800	1,690	3,020	5,730	11,000	5,860	4,970	2,160	2,060	1,880	1,910	2,680
1915-1932, 1957-1982	min	236	222	199	441	1,380	1,770	1,160	837	622	603	430	226	904
Red Deer River	mean	9	9	16	65	84	133	101	65	50	31	18	10	49
at Red Deer	max	17	16	73	205	383	392	474	252	293	111	52	25	125
1912-1982*	min	3	3	5	13	15	37	32	29	18	13	8	3	21
Slave River	mean	1,920	1,770	1,570	1,790	4,540	6,090	5,830	4,900	4,230	3,850	2,560	1,950	3,420
at Fitzgerald+	max	2,870	2,860	2,710	3,310	7,420	7,920	7,930	7,290	5,720	5,280	3,820	2,590	4,340
1921-1982*	min	1,260	576	543	630	2,900	3,900	3,170	3,020	2,610	2,740	1,720	1,340	2,590
S. Saskatchewan River	mean	71	76	115	191	383	655	364	165	125	114	98	74	204
at Medicine Hat	max	197	149	270	559	1,020	1,640	1,070	523	628	401	263	148	418
1911-1982*	min	30	34	47	74	61	87	44	47	23	18	36	27	68

* Incomplete data (relatively few months or years missing, other than shown)

** Less than 1 cubic metre per second

+Regulated for part of period:

Bow River increasingly since 1913; North Saskatchewan River since 1960; Peace and Slave since 1968; Oldman River and South Saskatchewan River for most of the record period

1 345 000 000 m³
(2 723 000 Ac Ft.)

1 425 000 000 m³
(914 000 Ac Ft.)

109 980 000 000 m³
(84 192 000 Ac Ft.)

109 400 000 000 m³
(84 192 000 Ac Ft.)

109 400 000 000 m³
(84 192 000 Ac Ft.)

109 400 000 000 m³
(84 192 000 Ac Ft.)

2 754 000 000 m³
(2 233 000 Ac Ft.)

45 860 000 000 m³
(37 179 000 Ac Ft.)

3 067 000 000 m³
(2 486 000 Ac Ft.)

891 000 000 m³
(722 000 Ac Ft.)

7 118 000 000 m³
(5 771 000 Ac Ft.)

294 600 000 m³
(239 000 Ac Ft.)

1 842 000 000 m³
(1 493 000 Ac Ft.)
5 980 000 000 m³
(4 789 000 Ac Ft.)

Alberta
CANADA

MEAN ANNUAL RIVER DISCHARGES

Inflow and outflow values represent
the annual volume
Based on recorded data up to 1980

Total Outflow 131 469 000 000 m³
(106 584 000 Acre Feet)

Total Inflow 71 157 000 000 m³
(57 688 000 Acre-Feet)

Prepared by the Alberta Branch of Surveying and Mapping in 1982

1 087 600 000 m³
(882 000 Ac Ft.)

247 400 000 m³
(201 000 Ac Ft.)

315 200 000 m³
(256 000 Ac Ft.)

The largest and most dependable streamflow rises in the mountain and foothills region where average annual yields range from 100 to 1,300 mm. In dry years, as much as 90 per cent of the streamflow of the North and South Saskatchewan basin originates in the mountain and foothills region which has only 15 per cent of the basin area. In wet years, the proportion of flow from this region may be less than 70 per cent, largely because of the higher rainfall on the plains. This flow is more dependable and it has a better seasonal distribution and better quality than that of the plains areas. Reservoir storage is contributing to water regime improvement for hydropower, urban, industrial and irrigation purposes.

Rivers and lakes are large and numerous by the standards of many drier regions of the world; yet little more than two per cent of the streamflow of Canada rises in Alberta. The province has slightly more than two per cent of the freshwater lake area of the country. The area occupied by lakes is usually listed as being 16,800 square kilometres, but this does not include many thousands of temporary water bodies, small potholes, marshes and muskeg areas that in spring would have a much larger cumulative water surface. Many of these dry up in summer and fall. Others, in addition to many of the larger lakes, have seasonal fluctuations in water level.

Alberta has over half the consumptive use of diverted water in Canada, largely because it has the greatest area under irrigation. Secondary recovery of oil and gas is resulting in significant volumes of water being pumped into bedrock formations. Oil sands development, with its major losses of steam and evaporated water from plants and tailings ponds (which remain open throughout the winter) is resulting in the growing use of water. With careful water management for a wide range of uses, Alberta will be able to meet requirements well into the future. Regional and seasonal deficiencies in the drier years, especially in the south, involve a wide range of management techniques oriented both to increasing supplies and to using limited supplies more efficiently.



Government Services to Business

A number of government agencies are equipped to gather, analyze, compile and publicize information for the purpose of furthering the industrial development of the province. Several are prepared to give assistance, financial and practical, in selecting industrial sites, starting or expanding production, developing markets, supplying technical information, developing products or production processes, and in industrial design. Following is a listing, with brief services' resumes, of provincial and federal government organizations which provide assistance related to industrial development. Though not listed here, many cities and other municipal corporations also provide comprehensive services with greatest emphasis on securing best suitable site selection. For more complete information, please contact the agency through the address given.

As an additional and unique service the government has established the Regional Information Telephone Enquiries (R.I.T.E.) network. It is designed to provide businesses and citizens of Alberta with a convenient, free of charge means of securing information from their government.

The system provides a convenient means for contacting the right department or individual in government by eliminating the costs of long distance calls and the need to enter into exchanges of correspondence. Detailed instruction as to use of the system is included in all regional telephone directories.

Provincial Government Services

Agri-Food Development Branch

This Branch links agricultural producers and food processors.

The Branch staff puts industry in contact with experts in processing, technology, business analysis, food testing and quality control, packaging, promotions and domestic or international marketing. The Branch provides direct manpower and financial assistance for organizational development, product identification and promotion, production and marketing education and specialized areas not covered by other government programs, such as product launch programs, consumer taste tests and training programs in marketing.

Agri-Food Development Branch
Alberta Agriculture
J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, T6H 5T6

Agricultural Processing Development Branch

The Branch provides a variety of technical, economic and information services to the feed, food and agricultural processing industry in Alberta. The Branch programs respond to the need for improved awareness of new technology markets; to the need for productivity improvements; to the need to encourage new product, processing and packaging development; and to the need to find

Main Lobby to
Alberta's Legislature
Building, Edmonton



and several ways to increase research utilization in the Alberta food industry.

Information and financial assistance is available to those wishing to expand and upgrade existing facilities, or to construct new facilities in Alberta; to develop new products and processes which enhance a firm's position in the industry or marketplace and to other agencies involved in the development function.

Agricultural Processing Development
Branch
Alberta Agriculture
J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, T6H 5T6

Alberta Agricultural Development Corporation

The Agricultural Development Corporation is an agency of the Crown established within Alberta Agriculture which provides financial assistance to primary producers of agricultural products, the owners of associated businesses and agricultural industries.

With respect to Agribusiness Lending programs, the Corporation may provide loan guarantees and direct loans to assist new agribusiness to become established and assist existing agribusiness to expand in order to increase the further processing of agricultural products and provide necessary services to primary producers, thus helping to make rural centres more viable.

Agribusiness enterprises which process primary products or provide a necessary service to farming enterprises and which are unable to obtain reasonable cost financing from other sources may apply for assistance under these programs. The Corporation provides financial advisory services and where need and repayment ability are established, guarantees loans or provides direct loans.

Loans are available to agricultural businesses for buildings, land, equipment, permanent improvements, operating funds and debt consolidation. Common applicants are owners of feed lots, greenhouses, feed mills, alfalfa plants and veterinary clinics.

Manager, Agribusiness Lending
Alberta Agricultural Development Corp.
4910 - 52 Street
Camrose, Alberta
T4V 2V1

Alberta Bureau of Statistics

The Alberta Bureau of Statistics provides economic, demographic and social statistics on the province to businesses, organizations, individuals, and governments. In addition it advises, educates and provides appropriate related services to statistical users.

Information and related services are provided through response to direct enquiries, through ASIST - (the computerized Alberta Statistical Information System) and in Alberta Bureau of Statistics publications covering either a broad range of statistics or such specific areas as:

- Pay and benefits
- Retail trade
- Manufacturing
- Price comparisons
- Current and projected population
- Economic accounts
- Structure of the economy
- User manuals and series directories for statistical information systems.

The Bureau also provides a full range of information from Statistics Canada and a variety of other sources.

Alberta Bureau of Statistics
Alberta Treasury
7th Floor, 9811 - 109 Street
Sir Frederick W. Haultain Bldg.
Edmonton, Alberta
T5K 0C8

Alberta Microelectronic Centre

The Centre is a non-profit company, established to help Alberta industry learn about, and profit by applying new technology. It offers industrial training programs, custom courses, seminars, and workshops on microelectronic applications "in classroom" or "in house". These presentations range from basic awareness to technically advanced levels. Its mandate is to assist with operational analysis and productivity studies; perform feasibility studies for new microelectronic ideas; jointly design and implement new systems; coordinate new product developments in management and marketing and prototype design building and testing.

Alberta Microelectronic Centre
545 Central Academic Building
University of Alberta
Edmonton, Alberta T6G 2G1

Alberta Oil Sands Technology and Research Authority

The Alberta Oil Sands Technology and Research Authority (AOSTRA) is an agency of the Government of Alberta, established in 1974. The original responsibility of AOSTRA was to encourage and support the development of technology that would lead to efficient commercial production of bitumen from the deep oil sands of Alberta by in-situ methods. Responsibilities have been extended to include research and technology development for improvements in surface mining and separation of bitumen from mined oil sands, improved upgrading and refining of bitumen and heavy oils, and enhanced recovery from conventional and heavy petroleum reservoirs. AOSTRA is also concerned with environmental acceptability of the production and processing technologies being developed.

AOSTRA welcomes applications for financial support for research projects and technology development projects that deal with any aspects of oil sands or heavy oils and also those concerned with enhanced recovery from conventional oil reservoirs. AOSTRA sometimes publicly solicits applications for work on specific projects.

The Registrar, Alberta Oil Sands
Technology and Research Authority
500 Highfield Place
10010 - 106 Street
Edmonton, Alberta
T3J 3L8

Alberta Opportunity Company

The Alberta Opportunity Company is a Crown Corporation administering the Alberta Opportunity Fund. The purpose of the fund is to stimulate the establishment of new businesses and to assist in the expansion of existing enterprises. To achieve its purposes the Company may make loans, or guarantee loans of other lenders, and provide management counselling or other specialized services. A.O.C. only lends money when conventional financing is not available.

Except for resource-based industries, public utilities, finance companies, and suppliers of residential accommodation, most types of business operating for gain or profit are eligible for assistance. In considering applications priority is given

to Albertan-owned enterprises, to smaller businesses, to job-creating projects, and to businesses in smaller population centres.

Alberta Opportunity Company
P.O. Box 1860
Ponoka, Alberta
T0C 2H0

Alberta Research Council

The Alberta Research Council is a Crown Corporation dedicated to promoting responsible economic development in Alberta through science and technology. It provides a full range of services: pure and applied research; analytical laboratories; industrial engineering problem-solving. In 1984 it has a staff of over 500 working in laboratories and offices in Edmonton, Nisku, Devon, Red Deer, Calgary and Lethbridge. It operates under the authority of the Alberta Research Council Act.

The Alberta Research Council has identified six major areas of research and assistance: oil sands; coal; natural resources; frontier sciences; and advanced technologies.

The industrial and engineering research program provides short-term advisory and technical services to manufacturing and processing companies in Alberta. Services include computer access to reference information on 95 per cent of the world's published scientific and technical literature. These services and a financial assistance project are funded by the National Research Council. The program also includes projects in transportation, forest products and product materials testing. Oil sands research includes heavy oil cracking and in situ recovery. Liquefaction, pyrolysis, coal property definition, and gasification make up the coal research program.

Natural resources research includes geological surveys, terrain sciences and atmospheric sciences.

Research into new catalysts, electro-organic reactions, low temperature biology, and enzyme design studies using genetic engineering techniques are included in the frontier sciences program.

The advanced technologies program provides industry with information and assistance in microelectronic, computer and automated systems.

One of the Alberta Research Council's

primary functions and highest priorities is to work closely with industry to provide business with the research capability required but not available in the private sector. Through this industrial strategy, Alberta businesses can develop new industrial opportunities in the province. The Alberta Research Council will consider proposals on joint research ventures and contract projects or on other ways of doing business.

Alberta Research Council
4th Floor, Terrace Plaza
4445 Calgary Trail South
Edmonton, Alberta
T6H 5R7

Alberta Research Council
Foothills Professional Bldg.
1620 - 29 Street N.W.
Calgary, Alberta
T2N 4L7

Business Analysis Branch

The Branch supports emphasis in the areas of marketing, further processing and rural development. The Branch conducts grants/loan evaluations and audits under specified Departmental financial assistance programs such as the Nutritive Processing Agreement and provides business management services to agri-business and agricultural organizations.

Business Analysis Branch
Alberta Agriculture
J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, T6H 5T6

Centre for Frontier Engineering Research

The Centre is an incorporated, non-profit organization focussing on research related to materials, design and construction for arctic and offshore resource development. C-FER is committed to working closely with Canadian industry and government in order to facilitate increased productivity in frontier development.

C-FER provides the focal point for the research and development necessary to promote Canadian participation in the exploitation of northern and offshore resources. In addition to enhancing the

research efforts of Canadian industry, C-FER has its own on-going research program. Early work comparing international regulatory standards has led to the publication of reports on design guidelines for both steel and concrete fixed offshore structures. Current priorities include materials, fabrication, design, regulation, transportation and construction of structures required for both ice-infested and other offshore environments. The initial focus is the development of rational design procedures for low temperature steels. C-FER is also capable of carrying out appropriate contract research.

President,
Centre for Frontier Engineering Research
Building 7A
University of Alberta Campus
Edmonton, Alberta, T6G 2E2

Coal Research and Technology Office

The Office of Coal Research and Technology was established to provide the means to assist, encourage and promote: research and development relating to technological methods for the exploration, recovery, transportation, preparation, storage and utilization of Alberta coal resources in a manner that is efficient, economical, safe and environmentally acceptable; identification, monitoring, acquisition and adaptation to Alberta conditions and coal resources of research and development in other jurisdictions; co-operation with and among other governments, industry, universities and other institutions or agencies.

The primary focus is to identify, investigate and develop those technologies considered likely to be commercially important in the next decade and which will: enhance the competitiveness of Alberta coals in international markets; minimize the environmental impact of the production and utilization of coal in Alberta; or result in new uses for Alberta coals.

This approach is intended to support and promote coal research and development by the private sector. The Office of Coal Research and Technology intends to share the risks and costs primarily for those situations where they would not be assumed by the private sector alone.

Chairman,
Office of Coal Research and Technology
2nd Floor, Pacific Plaza
10909 Jasper Avenue
Edmonton, Alberta
T6J 3M8

Farming for the Future

Funding assistance is available for research and demonstration projects aimed at improving agricultural productivity. The specific objectives of the program are to improve net farm income and to enhance the long-term viability of Alberta's agricultural industry.

Financial support is provided for approved research projects submitted by research institutions and private firms engaged in agricultural research and development.

Research Division
Alberta Agriculture
Room 206, J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

Food Laboratory Services Branch

The Branch, through its food laboratories in Edmonton and Airdrie, provides a wide range of analytical, consulting and other services to all sectors of the Alberta food industry, food exporters and various government agencies concerned with food production, processing inspection, transportation, retail trade and consumers.

Food Laboratory Services Branch
Alberta Agriculture
5th Floor, O.S. Longman Building
6909 - 116 Street,
Edmonton, T6H 4P2
and
Regional Office
Alberta Agriculture
Airdrie, Alberta

Food Processing Development Centre

The Food Processing Development Centre consists of pilot plant processing areas, a product development and evaluation laboratory, testing laboratories, and a technical information service. The mandate of the Centre is to increase the capability of Alberta's food processors to

meet the needs of the market place through application of new technology and development of new products and processes.

The Centre is equipped to serve the broad areas of meat, dairy, oilseed, specialty foods, vegetables, prepared foods and cereal products. Pilot scale equipment offers excellent capabilities to provide controllable variation in process conditions and accurate monitoring of process stages and product characteristics. The equipment simulates that used by industry and includes specialized equipment for developmental work.

Projects undertaken by Centre personnel can include informational and technical assistance, laboratory product development, pilot plant development, or on-site processing plant assistance. Projects can also entail the complete researching of ideas, developing the product, producing test market quantities, and ultimately assisting with industrial production.

Extended time or equipment use and extensive material usage may be billed to clients. Results remain the property of the client and are kept in confidence.

Food Processing Development Centre
Alberta Agriculture
P.O. Box 1217
Leduc, Alberta
T9E 2Y7

General Safety Services

In Alberta a number of safety programs dealing with equipment installation standards are administered by a division of the Department of Labour called General Safety Services. The branches in the Division include: Electrical Protection, Plumbing and Gas Safety Services, Elevator and Fixed Conveyances, Building Standards, Boilers and Pressure Vessels and Fire Prevention. The co-ordinated delivery of safety programs through a single agency provides a more uniform approach which can be beneficial to industry.

General Safety Services
Alberta Labour
Room 803
10808 - 99 Avenue
Edmonton, Alberta
T5K 0G5

Industry Development Branch

The purpose of the Branch is to enhance the performance and development of the high technology sectors and the film industry; to work with financial institutions, venture capitalists etc. in identifying development opportunities; and to encourage foreign investments. Services provided are: counselling industry in such matters as site location, sources and use of financing, business planning, government regulations and services, market data sourcing etc.; proposing alternative sector development strategies; identifying sector opportunities and stimulating action to realize these opportunities by causing new investment, both domestic and foreign, with an emphasis on joint ventures involving Albertans; providing a co-ordinating and catalytic linkage between the academic and government scientific and engineering community and industry, with emphasis on commercialization of technology; developing marketing strategies, proposing programs and identifying market demand factors.

Industry Development Branch
Alberta Economic Development
Floor 10, Sterling Place
9940 - 106 Street
Edmonton, Alberta
T5K 2P6

Manufacturing Industries Branch

The Branch advises and assists both in the establishment of new and in the expansion of existing manufacturing firms and industries in the following sectors: chemicals (including petrochemicals), metals and minerals, food industries, forest industries, engineering and construction, industrial products (metal fabrication), plastic fabrication, rubber products, textiles, consumer products, furniture and energy process industries. The Branch identifies industrial opportunities within these sectors, implements, administers and evaluates the economic development programs; and proposes, where appropriate, alternative sector development policies, strategies and programs which would contribute to the provincial economy and social good. The Branch is also charged with implementing the Alberta content policy on private projects and in implementing the "Accelerated Program of Support for

Alberta Companies Supplying Goods and Services to Government Projects"

Manufacturing Industries Branch
Alberta Economic Development
10th Floor, Sterling Place
9940 - 106 Street
Edmonton, Alberta
T5K 2P6

Market Development Division

The Division provides services to the agricultural and food industries to facilitate successful domestic and export sales. Financial programs and services available to Alberta companies and associations cover the entire marketing spectrum: analysis and identification of specific market opportunities; establishing contacts amongst marketers, buyers and sales agents; advising industry on merchandising methods, tariffs, health regulations, pricing, labeling requirements, transportation, financing and other key aspects of export and domestic sales; planning, arranging and participating in outgoing sales and incoming buying missions; assistance with participation in domestic and international trade shows and other promotional activities; identification of possible joint venture partners in Alberta and in the marketplace; setting up demonstration projects in the marketplace; development of market strategies and plans for specific markets; conducting market research and consumer profile studies; assistance to consulting firms in obtaining technical service contracts or international projects.

Market Development Division
Alberta Agriculture
J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

Northern Development Branch

Along with economic matters the Branch, as provincial co-ordinator of the Alberta North Subsidiary Agreement and the support group for the Northern Alberta Development Council, is concerned with the social aspects of northern Alberta development. These include manpower training, community infrastructure, education, law enforcement, housing conditions, health

services, transportation and communications. The objective is to achieve balanced socio-economic growth in northern Alberta.

Northern Development Branch
Department of Tourism and Small Business
10018 - 101 Street
Peace River, Alberta
T0H 2X0

Rural Development Division

The Rural Development Division fosters the strengthening of the economic viability of the rural community by providing development grants to firms to process in Alberta those nutritive products which have or may achieve through development of new technology, a competitive position in national or export markets. Financial assistance is provided through the Nutritive Processing Agreement (NPA), jointly sponsored by Alberta Agriculture and the federal Department of Regional Industrial Expansion, to producers of processed products of nutritive value to animals or humans, to processing operations that produce products of plant or animal origin and to private research and development facilities engaged in research on nutritive products or processing activities. The financial assistance available helps defer the cost of capital equipment purchase for new and modernized or expanded food processing industries.

Rural Development Division
Alberta Department of Agriculture
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

Small Business Division

The Small Business Division is divided into two branches: Small Business Assistance and Regional Business Development. Business analysts and business development representatives are situated in ten locations throughout the province to assist persons who want to open a business or who are already in business. Services and programs provided include business counselling; small business guidance with information on starting, financing, marketing and operating businesses; a management assistance program; community economic

development assistance; community profiles to assist in business location and expansion decisions; an industrial land program; and a business site locations program.

Small Business Division
Alberta Tourism and Small Business
15th Floor, Capitol Square
10065 - Jasper Avenue
Edmonton, Alberta
T5J 0H4

Small Business Equity Corporations Program

The Small Business Equity Corporations Program is designed to stimulate the formation of pools of equity capital through the province. These pools will be privately organized, privately capitalized and privately managed. The Government of Alberta will not be providing investment capital for small business. Rather, it will be providing incentives to stimulate investment by the private sector in small business.

Once formed, these equity capital pools will provide Alberta small business with access to equity capital which has been difficult to obtain through other programs and practices.

The Small Business Equity Corporations Program is providing \$15 million in incentives to investors, which has a potential of stimulating up to \$50 million in equity investment in Alberta small business.

Small Business Equity Corporations
Program Office
14th Floor, Capital Square
10065 - Jasper Avenue
Edmonton, Alberta
T5J 0H4

Strategic Planning Branch

The branch has three main areas of responsibility: policy analysis, economic planning and analysis, and research. Analyses and reviews of economic activities, institutions and policies are made to provide advice to government officials on the policy options available to achieve economic objectives. Businesses and government are provided with information on current and prospective economic conditions affecting the province. Research is undertaken to meet

tools for economic and market information.

Strategic Planning Branch
Alberta Economic Development
9th Floor, Sterling Place
9940 - 106 Street,
Edmonton, Alberta
T5K 2P6

Trade Development Branch

The purpose of the branch is to assist Alberta's industrial and business consulting sectors to expand export sales activity. It works directly with individual companies or groups of companies to sell products and services outside Alberta. Staff members assist companies in developing export sales. Activities of the branch include identifying export opportunities, organizing incoming buyer and outgoing sales missions, organizing and co-ordinating participation in trade expositions and providing specific expertise on foreign export projects.

Trade Development Branch
Alberta Economic Development
11th Floor, 9940 - 106 Street
Sterling Place
Edmonton, Alberta
T5K 2P6

Transportation Services Branch

The branch has the responsibility for reviewing and recommending programs, strategies and policies which will assist in the efficient transportation and distribution of Alberta products as well as the promotion of efficiency in passenger transportation. The branch advises industrial and trade groups with respect to transportation services and rates, as well as regulations and legislation pertaining to transportation matters.

Transportation Services Branch
Alberta Economic Development
9th Floor, Sterling Place
9940 - 106 Street
Edmonton, Alberta
T5K 2P6

Federal Government Services

Business Information Centre

Business Information Centres are a new concept in business government communication. Set up and operated by the Government of Canada, the centres are designed to make it easier for business people to get in touch with appropriate federal government officials. The centres are staffed by personnel who can cut through "red tape" and provide the business person with a speedy answer to questions about government services, programs, opportunities, problems, policies, people, regulations, or other business matters affecting them.

Telephone 420-2952 in Edmonton or Zenith 0-3200 elsewhere in Canada.

Department of Regional Industrial Expansion

The Department of Regional Industrial Expansion (DRIE) works to stimulate industrial growth in all parts of Canada in order to reduce economic disparity and foster a climate that encourages Canadian business firms to become more competitive internationally.

DRIE offers market, trade and business information and advice. Financial assistance can also be made available to eligible manufacturers, processors and tourism operations.

Through the Industrial and Regional Development Program (IRDP), DRIE provides assistance to industry throughout Canada. In Alberta, IRDP can assist manufacturing, processing and tourism industries to: expand or modernize their existing production facilities; better market their products; or develop new products or processes.

DRIE administers the Small Businesses Loans Act (SBLA), a loan guarantee program to help new or existing small business obtain loans for a variety of capital improvement purposes. With interest set at one per cent above prime lending rates, SBLA loans are negotiated directly with chartered banks, Alberta Treasury Branches or other lenders designated under the Act.

The Program for Export Market Development (PEMD) helps incorporated Canadian businesses to develop, increase and sustain their activities by sharing with them the costs of specific export

marketing efforts. PEMD is geared to: encourage businesses that have not exported previously to begin export marketing; and encourage established exporters to expand their activities in new markets.

DRIE maintains the Business Opportunities Sourcing System, (BOSS), a data base on Canadian companies and their products. Application forms for businesses wishing to be included in the BOSS inventory are available at any of their offices.

Tourism contributes to the economy of every community in Alberta by providing local jobs in such areas as hospitality, transportation, and recreation. Tourism Canada specialists in DRIE offices are the contact points for information on the Canadian Government's tourism marketing and development program.

For further information on those, and on other programs and services of the department, contact:

Department of Regional Industrial
Expansion
Regional Office
Cornerpoint Building
10179 - 105 St., Ste 505
Edmonton, Alberta
T5J 3S3

Calgary Office
Harry Hays Building
220 - 4th Ave., S.E., Suite 630
Calgary, Alberta T2P 3C3

Export Development Corporation

The Export Development Corp. (EDC) is a Crown Corporation that provides a wide range of insurance, guarantee and loan services in order to facilitate and develop Canadian export trade.

EDC facilities are provided to enhance the ability of firms selling Canadian goods and services to compete effectively abroad. There is a no minimum value of export business required to qualify for support.

Suite 2380,
East Tower Esso Plaza
425 - 1 Street, S.W.
Calgary, Alberta, P2P 3L8

Federal Business Development Bank

The Federal Business Development Bank (FBDB) is a Crown Corporation that exists to promote and assist most types of businesses in Canada at either the start-up stage or at some other stage in their development. It pays particular attention to the needs of small and medium-sized businesses.

The Federal Business Development Bank offers three principal services to Canada's business community: financial services (loans, loan guarantees and financial planning), investment banking, and management services such as counselling, training and information.

The FBDB complements the services offered by financial institutions in the private sector by providing funds for worthwhile projects that are not available elsewhere on reasonable terms and conditions.

3015 - 12th Street, N.E.
Calgary, Alta.
T2E 7J2

10601 Southport Road, S.W.
Suite 328
Calgary, Alta.
T2W 3M6

606 Principal Plaza
10303 Jasper Ave.
Edmonton, Alta.
T5J 3N6

Pleasantview Professional Bldg.
Room 405
11044 - 51st Avenue
Edmonton, Alta.
T6H 5B4

10135 - 101st Avenue
P.O. Box 10
Grande Prairie, Alta.
T8V 0Y4

Professional Building
Suite 500
740 - 4th Avenue S.
Lethbridge, Alta.
T1J 0N9

Riverside Office Plaza
Suite 100
4919 - 59th St.
Red Deer, Alta.
T4N 6C9

Statistics Canada

Staff of the regional office provide statistical information needed by governments, industry, and the general public to understand the social and economic conditions of the province and country.

The Advisory Services Division helps people identify, obtain, and effectively use statistical information. The Division promotes the use of statistics through visits, talks and meetings to assist potential users with data problems.

Statistics Canada
Room 215
11010 - 101 Street
Edmonton, Alberta
T5H 4C5

Research & Development Parks

Calgary Research and Development Authority

The Calgary Research and Development Authority is a tripartite agency of the City of Calgary, the Calgary Chamber of Commerce, and the University of Calgary, established in 1981 to foster the establishment and growth of high technology industry and, specifically, research and development. Board members are drawn from private industry, the City, the University and from the Provincial Government. The CRDA operates two research parks, the 105 acre University Research Park, located contiguous to the University on the north side and the 1066 acre Research and Development Park located north west of the University. The Research and Development Park is being developed as a research and development park permitting associated manufacturing.

To assist the emergence and growth of advanced technology companies the CRDA plans to have established by year end 1984 the Calgary Advanced Technology Centre, an incubator building and innovation centre for advanced technology companies. Services include space, office amenities, access to University of Calgary computing and library facilities, management consultants, at reduced rates, and a seed capital fund specifically to launch advanced technology companies. Alberta Research Council are committed tenants

in the ATC where they will headquarter their Industrial Group, which offers assistance to small Alberta companies, and their newly formed Advanced Technologies Group.

President,
Calgary Research and Development
Authority
Suite 1135, Bow Valley Square 1
202 - 6 Avenue S.W.
Calgary Alberta
T2P 2R9

Edmonton Research and Development Park

The Edmonton Research and Development Park was opened in 1981 to provide an attractive setting for new research and development facilities. Located in south Edmonton, the Park offers convenient access to the International Airport, the university campus, downtown, and major highways. The current Park area comprises 64.75 hectares (160 acres) with an adjoining 64.75 hectares (160 acres) owned by the Alberta Research Council.

Land in the Park has been developed with a view to recovering the costs of such development only, and is accordingly priced very competitively. Services are provided for sewer, water, natural gas, power and roads. Land is offered either on long-term leases or sold to occupants outright. The Park will also build to suit individual tenants, or lease space in a Multi-Tenant Research building owned by the Research Park Authority.

While research and development is the principal theme of the Park and all tenants will be expected to demonstrate minimum commitments in this area, a broad range of other activities are permitted, including prototype development, light manufacturing, marketing and administration.

General Manager
Edmonton Research & Development Park
Authority
1621 Canadian Commercial Bank Tower
10104 - 103 Avenue
Edmonton, Alberta
T5J 0H8

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